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Examining a differentiated science unit through a listening stance

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EXAMINING A DIFFERENTIATED SCIENCE UNIT THROUGH A LISTENING STANCE

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Abstract

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The purpose of this qualitative research was to investigate the relationship between differentiated instruction and Schultz's (2003) Framework for Listening. Based on Schultz's four types of listening, data were gathered on a class of fourth grade students through the use of a student survey, student-teacher journals, a student-adult interview, and a pretest. This data was continually examined in order to inform differentiated instruction on a daily basis. After a month of listening, a differentiated science unit was created based on the information learned about students through listening. The teaching of, and student responses to the differentiated unit became another source of data. After the completion of the differentiated science unit, all data were categorized and re-examined in order to analyze how each of Schultz's four types of listening impacted differentiated instruction and other classroom practices. It was found that listening to know particular students was a way of informing differentiation and developing a working relationship with students, listening for the rhythm and balance helped create a productive learning environment and maintained classroom management, listening for the social, cultural, and community contexts of students' lives led to better understanding of student interests and involvement, and listening for silence and acts of silencing was an effective way of making sure everyone's needs were met. A discussion of listening and differentiated instruction's implications for teaching and learning is included.

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Chapter I

Scope of the Study

Introduction

"...any classroom with more than one student presents a range of learning needs." (Brimijoin, 2005, p. 254)

It is Wednesday morning; the class is currently split up in centers based on their reading groups. Mrs. Beck is working with one of the groups while the other two groups complete previously assigned work. I am floating between these two groups, answering questions when needed and helping to ensure that each center runs smoothly. As I finish answering a student's question, I see Matt's hand shoot up. I walk over and ask Matt if he has a question. "I'm done," he replies. The center has only been going on for five minutes of the fifteen minutes students are given to complete their assignments. "Are you?" I ask as I lean over to check Matt's answers. Seeing that Matt has completed all of the questions correctly I answer my own question, "I guess you are!" Matt looks at me with a smile on his face," What should I do next?" I point to a small poster on the blackboard at the front of the room, "There is a chart of activities you may work on if you've finished your work early." Matt's smile disappears as he replies, "But I've already done all of that too." In disbelief I go over the list of activities with Matt one-by-one.

"The brainwork sheets on the board?" (Extra work students can do for extra credit.)

"Done."

"Your leveled reader?" (a book and worksheet students had to complete by Friday)

"Done."

"Your math contract?" (a packet of 6-7 worksheets based on students' level to be completed by Friday)

"Done."

“Your spelling homework? (Daily spelling homework consisted of one page in the spelling workbook.)

Matt began to pull out his spelling workbook and homework folder in order to prove to me that all of his work was done.

“It’s ok, you don’t have to show it all to me,” I told Matt, knowing that it would take more time than I had at the moment to check all of the work. Seeing other students beginning to raise their hands I once again pointed to the chart on the blackboard at the front of the room. “If you have finished all of those things, you may either read silently or write in your journal.” As Matt pulled his silent reading book out of his desk and began to read, it was painfully obvious that Matt had known exactly how this encounter was going to end before he raised his hand. He just wanted to show me that he had already finished all of his work.

Having resolved Matt’s issue of what to do next, I moved on to Marley, who was sitting in the other group with her hand raised. As I came over Marley timidly told me “I don’t understand the question.” I looked down at her paper to see which question she did not understand, only to realize that it was the first question on the worksheet. The only thing written on the worksheet was Marley’s name. In the time that Matt had managed to complete his entire assignment, all Marley had been able to do was write her name and try to figure out the first question. All I could think to myself was, “something isn’t right here.”

The situation I encountered with Matt and Marley did not just happen one time. Matt, as well as a few other students always finished their work very early while Marley and a few other students always seemed to lag behind. The classroom teacher was well aware of what was going on, and as evidenced by the chart on the board, had made many attempts to try and address the issues. Students in the class were already being given different level materials in both reading and math, and brainwork activities had been created to give the early finishers a

worthwhile activity to complete while they waited for their peers to catch up. None-the-less, the fast paced workers still blazed through their assignments, finishing all of their work and extra work by the middle of the week.

Purpose Statement

As Brimijoin (2005) points out in this chapter's opening quotation, every student has different learning needs. This does not just refer to differences in students' levels, but also refers to variances in students' interests, and modes of learning. The chapter's opening vignette highlights issues that can arise as a result of a variance in student levels within a classroom, but similar issues can also result from variances in the other two aforementioned areas. Tomlinson et al. (2003) explain that students from varying backgrounds have widely varying needs. By 2035, students of color will make up the majority of students in our public schools. (Tomlinson, et al., 2003) Our public schools are becoming more diverse, welcoming students from an increasingly wide range of backgrounds. The heterogeneous classrooms that are arising in schools include students who vary more than ever in their reading and math levels, background knowledge, interests, learning style, and attitude toward school. As learners needs begin to vary more, situations like the one in the previous vignette will become more common. In light of the demographic changes that are taking place and will continue to take place, one of the biggest challenges for teachers is that "educators in the regular classroom are expected to meet the varied needs of diverse learners with a higher degree of accountability." (VanTassel-Baska & Stambaugh, 2005)

While educators have always been held responsible for the achievement of all of their students, no matter how diverse their needs may have been, the advent of No Child Left Behind legislation has put huge amounts of pressure on schools, administrators, and teachers to raise test scores. One would think this would encourage the adoption of teaching strategies that are

not just tailored to the "average" students and instead focus on teaching learners from a variety of backgrounds. Unfortunately, despite the increasing variance of learner needs in schools, and the availability of new, innovative, research based teaching strategies, the "one size fits all" heterogeneous model of instruction continues to be the norm. (Smith, 2009) Indeed, "while students are becoming increasingly diverse, and the content of popular culture that permeates students' lives outside of school is changing rapidly, there has been a press for standardization and uniformity inside schools." (Schultz, 2003, p. 10) The one size fits all model is popular because it supposedly offers equality of opportunity, but in reality often falls short in mixed-ability classrooms unless students' varying needs are considered. (Tomlinson, et al., 2003) Regrettably, variance in student needs is not considered enough in most classrooms, and achievement gaps that have developed among culturally, linguistically, ethnically, and economically diverse groups have become a concern of educators and policy makers alike. (Beecher & Sweeny, 2008)

Instead of a one size fits all education, what is needed is for students' varying individual needs to take the forefront in informing instruction. Instead of planning a lesson and expecting students to adapt to it, lessons should be planned with students' varying backgrounds and readiness levels in mind. This is exactly what the philosophy behind differentiated instruction aims to do. Differentiated instruction seeks to use students' different readiness levels, interests, and learning profiles to alter the content, process, product, and/or environment of a lesson to fit individual student needs. (Tomlinson, The differentiated classroom: responding to the needs of all learners, 1999) The main goal of differentiation is to maximize the potential to learn for every student in the classroom, not just those who fit the "norm". (Tomlinson, 2005)

An integral part of differentiated instruction is the processes of pre-assessment and formative assessment to determine students' varying needs and to make sure students are responding well to the instruction (Brimijoin, 2005). Normally, pre-assessment is done through the use of activities such as webbing, KWL charts, oral questioning, group discussions, interviews, and inventories. (Brimijoin, 2005; King-Sears, 2008) Likewise, formative assessments are normally conducted through examinging student work, oral questiong, group discussions and interviews. (Brimijoin, 2005; King-Sears, 2008) These methods only touch on the surface of what students know though. One interview, or one group discussion is not truly enough to learn about students. To really get to know ones' students, student sharing and teacher listening must be made an explicit part of the curriculum. This is the idea behind Schultz's framework for listening.

Schultz (2003) uses the term listening to refer to "how a teacher attends to individuals, the classroom as a group, the broader social context, and, cutting across all of these, to silence and acts of silencing." (pg. 8) Listening does not just encompass what students say, but also what they write, what they do, how they act, and what they do not say. (Schultz, 2003) By choosing to take a listening stance, a teacher is choosing to make learning about their students part of their curriculum. This idea fits perfectly with the pre-assessment and formative assessment componenets of differentiated instruction. For this reason, the purpose of this study will be to examine the process of teaching a differentiated unit while taking a listening stance.

Statement of Research Problem and Question

Despite increasing learner variancein schools today, curriculum is being standardized. What is needed is a method of instruction that draws on individual learners' differing readiness levels, interests, and learning profiles. To effectively tailor instruction to students varying needs

it is essential to learn about the students themselves . Taking these things into account, my question becomes: What happens when I use a listening framework to inform and examine a differentiated science unit.

Story of the Question

One of my great interests in education lies in the area of gifted education. Unfortunately this was not really a doable topic for my thesis because I was not able to be placed in a gifted classroom for my student teaching placement. Because of this, I picked another topic of interest to me that was somewhat related to gifted education: differentiation. I have learned a lot about differentiation in my classes, but in my experiences and observations the theory hasn't transferred well into real life. Some questions I had were what happens to gifted children in the regular education classroom, how much time do these students spend in their enrichment programs versus regular education, and how do enrichment program teachers and regular education teachers collaborate?

I wondered if the higher level students were learning to their full potential in the regular education classroom. There is much talk about the least restrictive environment in special education, and I wondered if the regular education classroom is restrictive for some of the higher level students? I often saw students in my practicum placement finish their work extremely early, and even though the teacher had prepared additional assignments for students to do in their extra time, the students also blazed through those and were left with nothing to do except read (The vignette at the beginning of this chapter was one such example). Combining all of these questions lead me to the question: What can teachers do to make instructional time valuable for all students, high and low?

I recognized that this question was not suited for the kind of inquiry based research that I was being asked to do, especially in its phrasing. After all, words like "valuable" are not clearly definable, and my interests actually lie in all of the time students spend in the classroom, not just instructional time. In addition to this, I wondered how I could alter instruction so as to keep it challenging but not at too high of a level that students are left behind. I wondered what could be done to teach both the students who already know the material and those who don't at the same time. I didn't want to leave students behind or ahead. I wondered what I could do that incorporated my knowledge of my students varying abilities in order to better instruct them. I wanted to know what I could do to make use of my students varying levels of independence. Would it be ok to focus more of my time on the less independent students? I wanted know how I could identify these attributes in students and use my knowledge to enrich or re-mediate the students who need it.

Combing all of those questions into one inquiry based question, I came up with the question: What happens when I use my knowledge of students varying knowledge, readiness, and independence levels to plan curriculum? But even this was not specific enough. To make my question more specific I needed to fix my phrasing of the components I was going to examine and choose an area of subject matter. For the components I wanted to examine I simply referred to literature on differentiated instruction. For a subject matter area I considered math, reading, social studies, and science. Science, being an area of personal interest for me, and a topic that leant itself to a variety of instructional models seemed like a perfect choice. And so my question became: What happens when I use my knowledge of students readiness levels, interests, and learning profile to plan a science unit.

My question was now in inquiry terms and was researchable, there was only one problem. It was nothing new. Many people had already planned and taught differentiated science units. I needed to make my question unique. To do this I thought back to my research on differentiated instruction. One portion of differentiated instruction that both interested and puzzled me was learning about students needs in order to plan instruction. I had only come across a few specific examples of pre-assessment and formative assessment models in my research. In thinking about what I knew, I realized that I had been learning about "listening" in my graduate classes, and that listening's main goal was to learn about the student. Although it was not explicitly a form of pre-assessment or formative assessment, the listening stance essentially made those two things a part of a teachers everyday curriculum. For this reason I decided to incorporate listening into the planning of my differentiated unit, and examine what happened. As a result, my final question became: What happens when I use a listening framework to inform and examine a differentiated science unit?

Organization of Thesis

Chapter one introducted my research question, as well as the story behind it. Chapter two presents a review of the literature relating to differentiated instruction and Schultz's framework for listening. Within chapter two differentiated instruction and the research backing it are discussed in depth before an examination of the listening framework and its specific componenents. Chapter three explains the design and context of this study. Chapter four reviews and analyzes the data collected during the study and the findings. Finally, chapter five presents the conclusion of my study as well as its limitations and future implications.

Chapter II

Review of the Literature

Introduction

Chapter 2 presents a review of the literature regarding differentiated instruction and Schultz's (2003) framework for listening. The first section of this chapter briefly discusses differentiated instruction's grounding in learning theory. Section two focuses on what differentiated instruction is and examines its various components. The third section of the chapter explains why differentiated instruction should be used in the classroom. Finally, the chapter's fourth section explores Schultz's (2003) framework for listening.

Differentiated Instruction's Grounding in Learning Theory

Although differentiated instruction is a recent addition to the world of education, its foundation lies in an older, widely accepted learning theory: Vygotsky's Sociocultural Theory of Learning. (Subban, 2006) As Subban (2006) points out in her review of the theories supporting differentiated instruction, "Several educationalists, researchers and school administrators view the social constructivist learning theory engendered by Russian psychologist, Vygotsky (1896-1934), as central to instructional enhancement, classroom change and redevelopment." (p. 936) At its most basic level, sociocultural learning theory suggests that there are social and cultural aspects to learning, and that learners must be examined within their respective social and cultural contexts. (Subban, 2006; Wang, 2007) Additionally, the learning theory posits that learners acquire knowledge through social interaction. (Subban, 2006) One of the main components of sociocultural learning theory is the idea that students learn most effectively within the Zone of Proximal Development (ZPD). The ZPD refers to the area in which the student can not understand concepts or complete work independently, but can be successful

with the assistance of a teacher, or knowledgeable peer. (Subban, 2006; Tomlinson, et al., 2003) Essentially, the theory is stating that knowledge is best gained when it is tailored to a certain level and taught through social interaction with a more knowledgeable other. The implications of this learning theory are that "the areas of social interaction, engagement between teacher and student, physical space and arrangement, meaningful instruction, scaffolding, student ability and powerful content all become elements to consider within the context of contemporary education." (Subban, 2006, p. 937) It is for this reason that differentiated instruction seeks to tailor the content, process, product, and environment of a lesson to individual students needs. (Dotger & Causton-Theoharis, 2010; Pierce & Adams, 2004; Tomlinson, 1999)

What is Differentiated Instruction?

Differentiated instruction has been approached from many angles and has had its name used in a variety of contexts, some of which fit and some of which do not. At its core though, differentiated instruction is a response, and possible solution to the ever increasing variance of learners in the classroom setting. In understanding differentiated instruction, it is important to recognize that it is not a single instructional strategy used in one lesson or unit; rather, it is a philosophy, or conceptual approach to teaching. (Tomlinson, 2005; Tomlinson, et al., 2003) The main goal of differentiation is to maximize the potential to learn for every student in the classroom, not just those who fit the "norm". (Tomlinson, 2005) This goal is achieved by constantly modifying curriculum and instruction in response to individual students' readiness, interests, and learning profiles. (Tomlinson, et al., 2003) Using what is known about students in these three areas, the teacher is able to choose, in any given lesson, whether to differentiate the content (what students are taught), process (how students are taught), and/or product (how

students demonstrate what they have learned). (Pierce & Adams, 2004) Additionally, in some cases, they teacher may even be able to differentiate the environment that students are working in. (Sondergeld & Schultz, 2008) Finally, differentiation involves the use of ongoing assessment to ensure that students are benefitting from the lessons and to inform future instruction. (Brimijoin, 2005) There are many different factors involved in differentiated instruction, and in order to understand the concept as a whole, it is important to first examine its parts. At the core of differentiated instruction is the desire to tailor learning to the varying needs of students.The areas in which instruction can be varied and what those areas entail is an appropriate place to start an examination of differentiated instruction.

The three areas of student variance that theory and research suggest teachers be attentive to are student readiness, interest, and learning profile. (Tomlinson, et al., 2003) The first of these areas, student readiness, is what is most commonly thought of when differentiation is discussed. It refers to "the students' ability level with respect to the lesson." (Pierce & Adams, 2004) Simply put, readiness is a student's previous knowledge of the topic being covered in the lesson. It is important to note that a student's readiness applies only to a single lesson or concept, and does not remain constant. Just because a student has a high readiness level for one topic does not mean he or she will have a high readiness level for all topics. This fact results in three essential consequences for differentiated instruction. First, in any setting differentiated by readiness, flexible grouping is important. (Pierce & Adams, 2004) Second, because readiness in one topic does not guarantee readiness for all topics, and because students come to school with varying levels of knowledge, pre-tests or other diagnostic tools such as webbing, KWL charts, oral questioning, and group discussions are important in determining who is at what readiness level. (Brimijoin, 2005; King-Sears, 2008) Finally, because not all learners move at the same pace, in lessons taking longer periods of time formative

assessments along with the flexible grouping is necessary. (Pierce & Adams, 2004; King-Sears, 2008; Tomlinson, 2005)

Differentiating instruction based on students' readiness level not only makes sense in theory, but is also supported by a variety of research. In contrast to one size fits all instruction in which the material is too hard for some students and too easy for others, differentiating for readiness allows students to receive materials at the appropriate level. According to the National Research Council, (1999) "Challenges…must be at the proper level of difficulty in order to be and remain motivating: tasks that are too easy become boring; tasks that are too difficult cause frustration."(p. 49) In her literature review of differentiated instruction, Tomlinson (2003) also cites a vareity of research that all suggest students should be working at a level of moderate challenge for learning to occur. The research discovered that students doing activities at this level were "more likely to sustain efforts to learn, even in the face of difficulty, than when tasks are too diffucult or underchallenging." (Tomlinson, et al., 2003, p. 126) In her literature review, Tomlinson (2003) also points out that when differentiating for readiness, students are being instructed within Vygotsky's Zone of Proximal Development (ZPD), where the materials being taught are slightly above the student's level but manageable with the some support from the teacher.Similarly an article by Burns (2002) points to research done which shows that students being taught at their appropriate level of challenge (termed instructional level) experience optimal learning. Finally, in more recent studies, it has been found that appropriate level instruction also also decreases problem behaviors in students. (Roberts, Marshall, Nelson, & Albers, 2001;Tyler-Wood, Victoria, Ceriejo, & Pemberton, 2004)

The second area of importance in which students vary is their interests. Just as students come to school with varying levels of readiness for different topics, so do they come to school

with different interests. Finding, and making use of these interests can be important to students academic development. (Tomlinson, et al., 2003) Just like with readiness, a pre-assessment, or interest inventory can serve as a good way to gain knowledge about students interests. (Pierce & Adams, 2004) Interest inventories can be taken at the beginning of the year, and then updated with teacher notes whenever the teacher learns something new.

The main reason behind differentiating for interest is the link between interest and motiviation. Much research has been done on this topic, especially as it relates to students labeled gifted and talented. In her article discussing Independent Study, a differentiation strategy, Powers (2008) states that "when a gifted person is interested in something, it can hold her attention for long periods of time and is usually verbalized, studied, and desired intensely."(p.58) Tomlinson (2003) mirrors this statement in her literature review, citing other research which showed that interest based studies were linked with motivation and had positive impacts on both short and long term learning.

Unfortunately, students are not always interested in all topics. An important part of differentiating for interest is allowing room for links, however small, from what is being learned, to the students' interests. Although this is not always possible, when it is, it has been shown as a way of ehancing motivation, productivity, and acheivement (Tomlinson, et al., 2003) One way to help ensure students' interest is to give them a choice in their activity. When students are encouraged to choose reading materials that intersted them, they are likely to be more engaged in their reading and thus experience higher reading performance (Tomlinson, et al., 2003). In her article, Powers (2008) cites research showing both interest and choice as strong movtivators for learning and achievement, and discusses a study showing that student choice improved motivation and academic performance. Finally, aside from prexisting interests, and giving

studens a choice, teachers may try to promote situational or contextual interest in place of individual interests. (Tomlinson, et al., 2003) Whatever methods teachers use, it is important that lessons be differentiated to represent a variety of student interests.

The final area of variance that teachers may consider in their planning is students' learning profiles. Unlike readiness and interest, the term learning profile is not as clear. Tomlinson (2003) defines learning profile as "a student's preferred mode of learning that can be affected by a number of factors including learning style, intelligence preference, gender, and culture." (p.129) Essentially a student's learning profile is the mode through which they most efficiently learn. Learning style encompasses a wide range of personal preferences including environment, spatial arrangement of the room, degree of learner mobility, temperature, emotions, interactions, physical needs and even time of day. (Tomlinson, et al., 2003) In her literature review, Tomlinson (2003) cites a meta-analysis of research on learning styles which indicated that adressing such factors resulted in "improved achievement and attitude gains in students from a wide range of cultural groups." (p.129)

Intelligence preference, previously mentioned in Tomlinson's definition of learning profile, refers to the way in which one thinks. Tomlinson (2003) cites three thinking styles: anayltical, practical, and creative. Others choose to use Howard Gardner's theory of multiple intelligences. (Dotger & Causton-Theoharis, 2010; Pierce & Adams, 2004) While some research suggests that students benefit from being taught based on their intelligence preference, other researchers prefer to give students a choice of which intelligence they use, so as not to lock the student in to one way of learning. (Dotger & Causton-Theoharis, 2010; Tomlinson, et al., 2003)

Finally, gender and culture may affect a student's learning profile. These two factors affect all aspects of students' lives including how they were raised, what their home life is like,

and what is expected of them, both in and out of school. Tomlinson (2003) points out that it is very important for educators to realize that students come from a variety of backgrounds, and trying understand the context of students situations can help educators to plan and teach appropriate curriculum. Although a lot of factors combine to create a student's learning profile, the bottom line is that understanding a student's learning profile is the same as understanding a student. Differentiating for learning profile is, in essence, differentiating for the social and cultural needs of the student.

The teacher's knowledge of students' variances in readiness, interest, and learning profile are incorporated into differentiated instruction by by modifying the content, process, product, and/or environment to fit the needs of individual students. Content, refers to "what students will learn and the materials that represent that." (Tomlinson, 1999) A common example of differentiating content is leveled reading groups. The students in these groups receive different books to read (content) based on their reading levels (readiness) and possibly interests. Content can also be differentiated through the use of instructional strategies such as compacting, cubing, think-tac-toe's, tiered lessons, learning contracts, and independent study. (Dotger & Causton-Theoharis, 2010; Pierce & Adams, 2004; Powers, 2008) An important note is that "differentiation means doing something different—qualitatively different." (Pierce & Adams, 2004, p. 63) Students at higher levels should not just be expected to do extra work, and students at lower level should not only be expected to do part of the work. Differentiation means that all students are doing challenging, developmentally approriate work that fits their needs. (Tomlinson, 1999) In differentiated instruction, teaches need to make use of materials for varying abilities and grade levels in one classroom. (Sondergeld & Schultz, 2008) As previously stated, pretests are a vital component of assessing what level of content or material students are ready for. (Sondergeld & Schultz, 2008)

Another part of the lesson that can be differentiated to meet diverse learners' needs is process. In her book, *The Differentiated Classroom: Responding to the Needs of All Learners*, Tomlinson (1999) defines process as "activities through which students make sense of key ideas using essential skills." (p.48) Simply put, process is what the students do to learn the content. (Pierce & Adams, 2004; Sondergeld & Schultz, 2008) Just as content differentiation is usually geared toward students' readiness and interest, process differentiation is usually geared towards students interests or learning profile. Process should be differentiated so that students are able to learn through activities that match their learning preferences and/or interests. For example in Dotger and Causton-Theoharis's (2010) case study using a think-tac-toe in science instruction, students were able to choose from a variety of activities based on Gardner's theory of multiple intelligences that all covered the same topic—levers. In this case study, students were able to choose a variety of methods to learn about levers including writing, a photo journal, acting out what a lever does, creating a bumper sticker about levers, and working with a partner to create a quiz about levers. (Dotger & Causton-Theoharis, 2010) Some other common variations in process include whether students work together or alone, what mode content is delivered through (lecture, video, computer, book, etc.), and how much student vs teacher involvement there is in the lesson. (Pierce & Adams, 2004; Dotger & Causton-Theoharis, 2010)

The third part of the lesson that can be differentiated to help meet varying students needs is the product. According to Tomlinson (1999) product refers to "how students demonstrate and extend what they understand and can do as a result of a span of learning." (p.48) In other words, the product is the outcome, or what student produce as a result of a lesson or unit. (Pierce & Adams, 2004) Giving students a choice of how they show what they have learned is one way of differentiating product. A common way of doing this is project choices which are created by the teacher and all cover the learning objectives of the lesson in

some way. (Sondergeld & Schultz, 2008) Product differentiation is often closely related with process differentiation because students may begin creating their product during the learning process, or may want to demonstrate their newfound knowledge through the same mode in which they learned it. This is also evidenced in Dotger and Causton-Theoharis's (2010) case study, in which the product of each space on the think-tac-toe board is directly related to the process through which the content was learned. For this reason, differentiation of product also mostly occurs in the areas of learning profile and interest.

The final part of a lesson that can be differentiated to meet individual student needs is the learning environment. Learning environment is defined as "the classroom conditions that set the tone and expectations of learning." (Tomlinson, 1999, p. 48) A student's preferred learning environment is determined largely by his or her learning profile. Some students may prefer a quiet classroom where they are able to work individually by themselves. Others may prefer a livlier setting where they are a part of a group and are able to move around. Varying the classroom setting to allow for both quiet individual work where students are able to stay focused in one spot, and group work stations where other students are allowed to move around is just one way in which learning environment can be differentiated. Teachers can also differentiate the learning environment by changing the mode of instruction or physical organization of the classroom. (Sondergeld & Schultz, 2008) In some lessons, differentiation of the learning environment might even mean students leaving the classroom to conduct some type or research or activity. (Dotger & Causton-Theoharis, 2010). A final note about differentiation of the learning environment is that just like product, it is closely connected with differentiation of process. Different environments lend themselves to to being more effective for certain processes. For example, a lesson involving group work would require an environment that allows children to sit in groups. Likewise a lesson involving internet research would require

a location with computers. When planning a differentiated lesson, it is important to recognize this link between process and environemnt.

Why use Differentiated Instruction?

After examining all of the components of differentiated instruction, it becomes clear that differentiating is a lot of work. Tomlinson (2001) aptly quotes Piaget in saying "The heartbreaking difficulty in pedagogy, as indeed in medicine and other branches of knowledge that partake at the same time of art and science, is, in fact, that the best methods are also the most difficult ones." (p.32) As shown in the previous section differentiated instruction has well researched benefits: Differentiating for readiness ensures that all students receive a respectful, appropriately challenging education, which in turn maximizes learning and minimizes behavior problems; differentiating for interest boosts motivation, and helps students to stay engaged longer and produce qualitively better work; and differentiating for learning profile can improve acheivement and atitiude, allowing students to learn in the mode with which they are most comfortable. That said, all types of differentiating require some extra work on the teacher's part. Because of this teachers may wonder whether or not it is worth it to differentiate. Additionally, many teachers believe that differentiated instruction does not adequately address the standards set forth by NCLB and does not prepare students for high-stakes standardized testing. Finally, many teachers worry that differentiating instruction is not fair, and can not easily be graded equitably.

One of the main reasons teachers do not differntiate, aside from not knowing what it is or what benefits it has, is that it seems like an overwhelmingly difficult thing to do. In her literature review, Tomlinson (2003) cites research that indicates "teachers are unlikely to accept strategies that require them to modify materials, change instructional practices, make long

range plans, or adapt scoring and grading criteria." (p.123) Teachers are probaly even less likely to accept strategies that require more modification than less. Because differentiated instruction is often percieved by teachers as as an educational philosophy that would require them to completely overturn their previous practices, many teachers are resistant to change (Tomlinson, 2001). The fact of the matter is that differentiation is not something teachers have to do over night. Not every lesson has to have differentiation in every component for readiness, interest, and leanring profile. It is ok to start by only differentiating one part of the lesson in one way and to continue doing this until it becomes natural (Pierce & Adams, 2004; Tomlinson, 2001). Then, another aspect of differentiation can be added. This process can be repeated until a classroom becomes fully differentiated. Tomlinson (2001) makes an important point in saying even a little progress in the direction of differentiation can help students. Differentiation is not an all or nothing educational philosphy, but one that can slowly be adapted.

Another issue many teachers have with differentiated instruction is that they believe it interferes with teaching the standards set for by NCLB and preparing students for high-stakes testing. McTighe and Brown (2005) phrase it well in saying "one of the most vexing issues facing contemporary educators involves the competing imperatives of meeting high-stakes accountability standards while addressing the individual needs and strengths of diverse learners." (p. 234) In their article, entitled *Differentiated instruction and educational standards: Is détente possible?,* McTighe and Brown address this issue by seeking to answer three questions: "How can teachers address required content and grade-level performance standards while remaining responsive to individual students?; Can differentiation and standards coexist?; and How do teachers maintain standards without standardization. (McTighe & Brown, 2005, p. 234) The article goes on to examine standards, differentiated instruction, and backwards design, another educational philosophy. In the end, McTighe and Brown (2005) come to the conclusion that

"standards and differentiation not only can coexist, they must coexist if schools and districts are to achieve the continuous improvement targets imposed on them by NCLB." (McTighe & Brown, 2005, p. 242) They answer their other two questions by stating that standards essentially just mean what students need to understand in the end. The pathways students take to get to this understanding may be varied and taken at different paces. Therefore, differentiated paths to get to the same basic understandings allow teachers to tailor instruction to individual students while still maintiaining the same basic standards for all. (McTighe & Brown, 2005)

In addition to the myth that differentiation can not coexist with standards is the idea that many teachers have that they must teach to the test instead of differentiating in order to prepare students for the high stakes standardized tests they must take each year. In her article entitled *Differentiation and high-stakes testing: An oxymoron?* Kay Brimijoin (2005) cited multiple studies that indicated teachers often forsook what they thought of as best practices in leiu of teaching to the test. Many teachers ended up trying to cover all the content on the test instead of developing deep meaningful units to engage the students. Brimijoin's (2005) article continues on to discuss a case study previously done by the same author on a 5th grade class who used differentiated instruction for an entire year and then compared the students' standardized test passing rates from the previous year to the current one. Going into the differentiated classroom 47% had passed the reading assessment, 53% passed math, 34% passed social studies and 42% passed science. Coming out of the differentiated classroom, 74% passed reading, 58% passed math, 58% passed social studies and 74% passed science (Brimijoin, 2005). Although these results can not be extrapolated to mean that differentiation will always help students do better on standardized tests, at least in that one classroom, differentiated instruction helped to increase students' passing rate. In her conclusion, Brimijoin (2005) states that "as counter intuitive as it may seem, it is possible for teachers skilled in differentiation to

improve student achievement and, at least to some degree, make differentation and high-stakes testing compatible.

A final issue that many teachers have with differentiated instruction is perception that it is inherently unfair, and does not lend itself to fair grading. In any differentiated lesson, students may be learning different content, using different processes, and creating different products. Some teachers question whether it is fair or not to teach different students different things. Dotger and Causton-Theoharis (2010) address this issue of fariness and differentiation by saying while differentiation may not be fair in the sense that all students do the same thing at the same time, it is fair in the sense that all students are getting what they need. Although some may argue that teaching different students different things is not equality of opportunity, they fail to recognize that because not all students are the same, some students might not be able to make use of the opportunities offered to them. Instead of offering one opportunity that only a handful of students can grasp, it seems a lot more equitable to offer a variety of opportunities that all students can make use of.

Another question many teachers have is how can students be graded fairly if they are learning and doing different things. In her article, *Grading and differentiation: Paradox or good practice*, Tomlinson (2005), tries to tackle this issue. The primary goal of grading, according to Tomlinson's (2005) article is "to provide high quality feedback to parents and students so they can clearly understand and appropriately use the information to support the learning process and encourage student success."(p. 263) Differentiation alone, provides no barrier to doing this, Tomlinson posits. In fact, Tomlinson points out, differentiation and grading have many of the same underpinnings. Both empasize what the student should know, understand, and be able to do at the end of an activity; both emphasize pre-assessment, ongoing assessment, and the use

of formative assessment data to made instructional adaptations; and both emphasize the the importance of summative assessments being based on specific goals and critera that were determined previous to instruction. (Tomlinson, 2005) As for grading in a differentiated setting, Tomlinson(2005) states,"there is nothing unfair about providing multiple pathways and support systems for learning. What matters is ensureing clarity and stability in criteria we will use to teach, construct assessments, and measure sucess"(p.266) Tomlinson then moves on to describe a grading system that would not only work well in a differentiated setting, but in any classroom. The proposed system is much like the current system with a few additions. It contains 3 separate grades: one for academic acheivment related to a set of clearly defined criteria (this is what is currently used in most schools), one for individual growth along a continuum of clearly defined criteria (student progress judged against oneself), and one for effort. This proposed system would give both the students and the parents more information that the current method of grading, and would provide a reference for teachers to look back at. (Tomlinson, 2005) In the end, Tomlinson (2005) concludes that differentiation and grading align together very well and that the barriers to the two working together are more real than imagined.

Schultz's Listening Framework

In her book, *Listening: A fromework for teaching across differences*, Schultz (2003) creates and outlines her framework for listening, and explains how it can serve teachers. Schultz's framework came about as a result of her research into how students learned and viewed their education, what she experienced in her initial research projects involving students who had "failed" school, and her desire to document "successful" teaching interactions. (Schultz, Listening: A framework for teaching across differences, 2003) As Schultz (2003) puts it, "the examination of both the macro- and micro-levels of schooling in order to understand students'

experiences in schools led me to develop a methodology for listening to and with students." (pg. 6) Like differentiated instruction, many of the research projects that form the core of the listening framework are grouded in sociocultural theories of learning. (Schultz, Listening: A framework for teaching across differences, 2003) And just like differentiated instruction, the listening framework rejects prescriptive, one size fits all teaching in favor of listening and tailoring instruction to students individual needs. (Schultz, 2003; Tomlinson, et al., 2003)

In her framework, Schultz (2003) uses the term listening to refer to "how a teacher attends to individuals, the classroom as a group, the broader social context, and, cutting across all of these, to silence and acts of silencing." (pg. 8) Listening requires teachers not just to observe students from afar, but to be up close and invovled in their learning. It does not just encompass what students say, but also what they write, what they do, how they act, and what they do not say. (Schultz, 2003) The term, *listening,* is used "both literally (teachers pay attention to students voices and how they are distributed across time and space) and metaphorically (teachers attent to childrens' verbal and nonverbal interactions; they read their facial gestures and the ways children move through space alone and together)." (Schultz, 2003, p. 44)

Taking a listening stance implies entering a classrom with questions as well as answers, knowledge as well as a clear sense of limitations of that knowledge. (Cochran-Smith & Lytle, 1999; Lytle & Cochran-Smith, 1992; Schultz, 2003; Schultz, Jones-Walker, & Chikkatur, 2008) It is important to understand that by definition, when taking a listening stance, it is impossible to know what or how to teach before meeting and interacting with the students. When listening to teach, the teacher as well as the instruction are formed by what is heard. (Schultz, 2003) In her framework,Schultz (2003) includes four components for listening: listening to know particular

students; listening for the rhythm and balance of a classroom; listening for the social, cultural, and community contexts of students' lives; and listening for silence and acts of silencing in classrooms and social institutions. Together, these four kinds of listening encompass the different ways in which teachers may look at and modify their classrooms in order to better understand and instruct their students.

The first type of listening put forth by Schultz (2003) is listening to know particular students. This form of listening focuses on knowing individual students, and the unique ways of learning and interacting that they bring to the classroom. (Schultz, 2003; Schultz, Jones-Walker, & Chikkatur, 2008) The goal of this type of listening is to help teachers understand students beyond the "surface" categories(ex. Being smart, talkative, the class clown, etc.) that are already touched upon in most classrooms. (Schultz, Jones-Walker, & Chikkatur, 2008) When listening to know a particular student, teachers learn how to create instruction that matches students' capacities and focuses on their strengths. (Schultz, 2003) Such listening allows teachers to change their practices to fit the needs of individual students instead of adapting a one size fits all model and expecting students to adapt to the classroom. (Schultz, 2003)

Schultz (2003) provides an example of listening to a particular student in her discussion of Kenya, a student who often had angry outbursts that resulted in her being rude to both her teachers and peers. Instead of immediately reprimanding Kenya however, her teacher asked Kenya to write about the incident in a short letter to the teacher as part of a classwide conflict management system that had already been establised in the classroom. This system gave Kenya time to gather her thoughts and correspond with the teacher in a more productive manner that also promoted literacy and writing. (Schultz, 2003) Because of this strategy, not only was the teacher able to effectively listen to Kenya through her letters, but Kenya became more

comfortable in her writing and in confiding in the teacher. As a result Kenya and the teacher were able to work with one another to discuss and work towards solving Kenya's anger issues all while praticing Kenya's writing. (Schultz, 2003)

The second component of Schultz's (2003) framework is listening to the rhythm and balance of the classroom. This refers to how teachers read and manage the landscape of the classroom through classroom rituals. (Schultz, 2003; Schultz, Jones-Walker, & Chikkatur, 2008) More specifically, rhythm refers to underlying structures; timing; patterns of interactions among students and between the teacher and the students; and the beat and pace of activities with and among students. (Schultz, 2003) Balance refers to how talk, activity, volume, and engagement are distrubuted across students and the physical space of the classroom. When teachers listen for balance, they listen to who is speaking and how participation is scattered throughout the classroom in order to make sure that one student or group of students is not overshadowing the rest. (Schultz, 2003) "Listening for the rhythm and balance of a group allows teacher both to lead and to follow the distinctive direction of each class." (Schultz, Jones-Walker, & Chikkatur, 2008, p. 161)

Common methods for listening to the rhythm and balance in a classroom include daily rituals like morning meetings, "sharing time", project/choice time and class discussions. (Schultz, 2003) "These rituals establish routines and opportunities for teachers to listen to and get know students as both individuals and as a collective." (Schultz, 2003; Schultz, Jones-Walker, & Chikkatur, 2008) An example Schultz (2003) gives of listening to the rhythm and balance of a classroom is the way Lynne Streib, a teacher, managed her classroom and had discussions with her second grade students. Mrs. Streib conducted one or two class discussions each week to listen to students, help students listen to one another, and to touch on subjects that might not

be covered in the core curriculum. (Schultz, 2003) These class discussions were very structured in their format and involved an introduction by the teacher and multiple chances for each student to participate. Mrs. Streib demonstrated her ablitly to listen to the rhythm and balance of the classroom by knowing who to let talk, what to let them talk about, when she needed to interrupt, when she needed to prompt students in the right direction, and when she needed to back off and let the students carry on the discussion. (Schultz, 2003) Through listening to the rhythm and balance of discussions, Mrs. Strieb was able to lead students in the right direction in order to help them both learn new concepts and solve social problems that arose in the classroom. (Schultz, 2003)

The third form of listening discussed by Schultz (2003) in her framework is listening to the social, cultural and community contexts of students' lives. Schultz (2003) points out that "students spend a relatively small portion of their day inside the classroom."(p.76) This combined with the fact that "official school curriculum often has a relatively insignificant influence on adolescents' lives" means that for most students, school is not the most important thing in their life. (Schultz, 2003, p. 77) Likewise, "when teachers take their experience with students in the classroom as the sum of their knowledge of students' interests and abilities, they are taking a narrow slice of students' lives and treating it as the whole." (Schultz, 2003, p. 77) This component of the listening framework helps teachers to look beyond the context of school to students' social, cultural, and community contexts in order to put together a more comprehensive picture of who students are. Having a better picture of who students are lets teachers in turn alter their expectations and interations with students in order to work better together. (Schultz, 2003) Listening to the wider contexts of students' lives involves learning about their cultural backgrounds, their social networks both in and out of school, and giving them opportunities to talk and write about their home life and involvement in their

communities. (Schultz, 2003) “By listening to the social, cultural and community contexts of students’ lives, teachers assist students to bring their most intimate experiences into the classroom; by listening more broadly to how students actively engage in ideas and meaning beyond school, teachers can find ways to encourage students to hold on their intellectual aliveness and havits of mind past their hours and years in school.” (Schultz, 2003, p. 108)

Despite its great benefits, bringing students home lives into school is often challenging. (Schultz, 2003; Schultz, Jones-Walker, & Chikkatur, 2008) In their article on listening in an urban seeting, Schultz, Jones-Walker, & Chikkatur (2008)describe a student teacher, Carol, who was able to incorporate this component of listening into her curriuclum by getting students to interview family members as part of a math lesson, and by asking students to make observations about their local neighborhoods as part of a science lessons. Schultz (2003) on the other hand, examines this component of listening through students writing outside of school. Although in all three cases mentioned in Schultz (2003) the students did not associate their outside of school writing with their in school writing, by showing interest in what the students were doing, Schultz was able learn a lot about the students’ lives outside of school, and discovered that despite their apparent deficiences in school, the students were actually avid writers in their own ways. Schultz (2003) found that major boundries preventing the students from linking their school and home writing were censorship (some topics were not appropriate ofr school), and the fact that school was seen as a public realm while many of the students wished to keep their writing private. Finding a way to overcome such boundries are challenges teachers must face in their efforts to listen to students. (Schultz, 2003)

The fourth and final type of listening discussed in Schultz’s (2003) framework is listening for silence and acts of silencing. Whereas the first three components of the framework sought

learn more about each of their respective ares, this fourth component, which is often over-looked, spans across all three of the previous components to examine what is not being said. (Schultz, 2003) Listening for silence includes listening for missing conversations, overlooked and divergent perspectives, moments when students are actively silenced by individuals and institutions, and moments when individuals or groups have been shut out of the conversation. (Schultz, 2003) "Silencing is about who can speak, what can and cannot be spoken, and whose discourse must be controlled." (Fine, 1991, p. 31) Throughout her chapter on silencing, Schultz (2003) mentions 9 possible patterns of silencing: silencing by institution, silencing by teachers, silencing by peers, individuals (students or leaders) shutting down conversations, groups silencing themselves through enacting a color-blind discourse, silencing through exclusion, and silencing through selection. (Schultz, 2003)

Schultz (2003) gives an example of listening for silence in her study of Summit Middle School. Here, she conducted research through focus groups, observations and interviews. Schultz (2003) highlights the story of 3 particular students who were silenced, as well as the focus groups which often provided examples of silencing in group settings. Although all three students that Schultz (2003) discusses had silencing affect them in different ways, all three cases were a result of a dominant white discourse in the school that was not responsive to critique and excluded or punished those who chose to go agianst the norm. Similarly, in the focus groups, silencing always came in reponse to intensified conversations of racial issues. Although, in the focus groups, silencing came from both adults and students, the topics that triggered acts of silencing remained the same. (Schultz, 2003) Indeed, "most often contentious discussions centered on risky topics are the onces silenced." (Schultz, 2003, p. 139)

Chapter III

Research Design and Methodology

Context

This study took place at Lucky Elementary School in Schooltown, New Jersey. Schooltown is a suburb of Philadelphia, Pennsylvania located in Camden County. Lucky is one of four elementary schools in the Schooltown Public School district. This district also contains one middle school, and one high school. Students attend Lucky Elementary School from kindergarten through fifth grade. In the 2009-2010 school year, Lucky serviced 596 students and employed 42 classroom teachers making the student to teacher ratio 14.19. Enrollment by grade K-5 respectively was 87, 93, 103, 89, 88, and 121 (15 ungraded). It should be noted however that the Schooltown district and especially Lucky Elementary has a very transient student population. The area that Lucky draws from contains many apartment complexes where families come and go throughout the school year. For example, the classroom in which this research was conducted had three students leave and five new students during school year. The demographic breakdown of Lucky Elementary's student body during the 2009-2010 school year was 52% White, 27% Asian, 15% Black, and 5% Hispanic. Out of its 596 students, 69 were eligible for free lunch and 28 were eligible for reduced price lunch.

More specifically, this study took place in one of Lucky's four fourth grade classrooms where I was simultaneously completing the requirements of my clinical internship (student teaching). The classroom contained twenty-six students, fifteen boys and eleven girls, at the time the study took place. The classroom contained eight White students, eight Asian students (six from India, one from Pakistan and one from the Philippines), six Black students, three students of two or more races, and one Hispanic student. Of the twenty-six students, eight had

Individual Education Programs (IEP) ranging from learning disabled to traumatic brain injury. Seven of these students went to the resource room for reading, and six went for math. All of these students received in-class support from a special education teacher during science, the subject in which this study was conducted.

Methodology and Research Design

Because the focus of this study is the examination of differentiated instructional unit through a listening framework which not only requires the teaching of a unit, but also the feedback of those involved in teaching and learning the unit, the teacher research paradigm was selected to conduct the study. Teacher research fits this study best for many reasons. First, teacher research is based upon observation of students in the natural environment of the classroom. (Hubbard & Power, 1999) The differentiated unit to be taught in this study needs to occur in such a setting. Second, teacher research puts an emphasis on understanding learning from the students' perspective. (Hubbard & Power, 1999) An important part of this study is seeing how the instructional methods implemented affect student perception of the lessons and student learning. Finally, this particular study will not only examine the results of differentiated unit taught through listening framework on students, but also examine how it affected the teacher, and informed his instruction. Therefore, a teacher research model in which "the practitioner himself or herself simultaneously takes on the role of researcher" perfectly fits this study. (Cochran-Smith & Lytle, 2009, p. 41)

The goals of teacher research also align themselves with the goals of this study. "Unlike large-scale education research, teacher research has a primary purpose of helping the teacher-researcher understand and improve her [or his] practice in specific, concrete ways." (Hubbard &

Power, 1999, p. 3) Indeed, one of the main goals of this study is to better understand the relationship between listening and differentiated instruction in order to better inform instruction. This study was conducted in order to examine a possible way to help instruction to better fit students' needs. At its heart, like any teacher research, this study is just a natural extension of good teaching. (Hubbard & Power, 1999)

An important point about this study and teacher research is that they are qualitative, not quantitative. Unlike a quantitative study which might seek to solve a specific problem or examine a single variable, this study takes a more holistic approach in examining the entire classroom environment. The purpose of this study was to examine the range of effects a differentiated unit and listening stance might have on a classroom, therefore, a qualitative, holistic, approach fits best. Cochran-Smith and Lytle (2009) point out that in teacher research, as well as other forms of qualitative practitioner inquiry, "notions of validity and generalizability are quite different from the traditional criteria." (p. 43) In a study such as this, the results are not intended to be generalizable and validity was determined by the detailed narratives that describe the study and its results. The trustworthiness of this study lies in the many varied data sources which will be described in the coming section, and the triangulation of said data to confirm that the results makes sense together.

The Study and Instructional Plan

My research study was conducted over five weeks in a 4th grade classroom. The study took part in two phases. The first phase of the study included gathering data about students and implementing classroom routines that reflected a listening stance. The goal of this phase was to become familiar with students through listening to them, and to allow students time to grow used to the new classroom routines. At the beginning of this phase, students were given an "All

About Me" survey as a preliminary way to get to know the students (see Appendix A). The survey included a list of open ended questions about what students liked and disliked both in and out of school. It also asked questions about the students' families.

Next, a student-teacher dialogue journal was introduced. Students already had journals in which they were allowed to write in their free time, but these were rarely utilized. The new student- teacher journal was introduced to the students as a personal mode of communication between each student and the teacher. Students were told that the teacher wanted to learn about them, and that they could write to the teacher about anything they wanted whether it be a new video game they bought, a book they read, a cool place they went, a lesson they liked, something they were having trouble with, or something they wanted to learn about. Likewise, the journal could be used to ask the teacher questions about any subject, whether it was covered in school or not. All students had to do was write about the topic of their choosing, put their journal in a box in the back of the classroom and the teacher would respond that night. Although the journals were largely voluntary, all students were asked to make an entry on the first day the journals were given. Similarly, as the second phase of the study drew closer, all students were asked to write about their favorite lesson they had learned in school. Finally, if a student had not written in their journal in a while, the teacher-researcher would write to the student, trying to prompt some discussion.

The second phase of the study included the teaching of a differentiated science unit about animal survival while using listening practices to help inform pre-assessments and formative assessments. Prior to the beginning of the unit, pre-assessment was conducted by using the aforementioned student journal entry about the student's favorite lesson, a student-adult interview, and a pre-test. First, students were asked write about their favorite lesson in

their journals. They were asked to write about what the topic was, what they did in the lesson, and why they liked it. Next, students were assigned an adult interview as homework. Students were asked to go home and interview an adult about animal survival (See Appendix B) Finally, students were given a pre-test containing open ended questions about adaptations, camouflage, mimicry, and inherited/learned behaviors to help determine their readiness levels (See Appendix C).

Using the data from the pre-test and the teacher's knowledge of students, students were assigned to one of three color groups based on their readiness level. The highest readiness level group (Green) consisted of five students who scored a three on the pretest, and four students who scored a two but had demonstrated the ability to work independently in previous lessons. The low readiness level group (Red) consisted of the four students who scored a zero on the pretest, and four more students who scored a one, but would benefit from the extra support and organizers that the Red group would be working on .The middle readiness level group (Blue) consisted of the other three students who scored a two, and the other six students who scored a one on the pretest. The animal survival unit was taught over a period of five days. There were three days of instruction, one day of review, and a day for testing. On each of the first three days, the three groups each did different activities. The fourth day included each group sharing with one another what they had learned. The final day was the test (See Appendix D for the block format lesson plans for the unit). Because the unit was only one week long (three days of instruction), the groups remained static. Some students in each group knew more about certain concepts than others, but this served the blue and red groups well in their daily meetings with the teacher. During the days students were learning about the science topic, they were encouraged to write about it in their journals.

On the first day on instruction, the lesson began with a class meeting. The new unit was introduced to the students. They were told they would be learning about animal survival. On the smart board, the students were shown a teacher-made web page created specifically for this unit. The webpage contained a variety of videos, some listed under the days they were supposed to be watched, and some listed as videos to watch in extra time (See Appendix E for a copy of the webpage). The students were told they would be using the website during class to watch a video on the first two days of the unit, and the rest of the videos they were free to watch whenever they had extra time during a science lesson, or at home. A video on camouflage was shown, and it was explained to students that this was an example of an adaptation, something that is necessary for animal survival. Students were asked what an adaptation was. After a student gave an answer the class was told that it would be learning about adaptations today, however, students were going to be learning in a different way during this unit. It was explained to the students that they would be separated into three groups during this science unit. The groups would all be learning the same things, but in different ways. Each group was going to work on activities that they would share with their classmates at the end of the unit. The groups were posted on the smart board, and the students names from each group were called out. Below the names of the students in each group, the instructions for the day were listed. Students were told they would be moving in centers, each center would last approximately ten to twelve minutes. For the most part different groups would be doing different centers so it was important that students only follow the directions that were listed under their group.

The blue group was instructed to take out their textbooks and read pages B66 and B67 and make a list of adaptations that they were going to use in discussion with the teacher later. The Red group was instructed to go on computers and watch the video under the Day One

heading. They were to remember at least three adaptations they saw in the video to discuss with the teacher later. Once the blue and red groups set off to do work, the green group was called to the front of the classroom. They were told that they would be completing a Think-Tac-Toe on Animal Survival (See Appendix F). A Think-Tac-Toe is a choice board with nine activities arranged in a tic-tac-toe board. Students must complete activities and cross out boxes to make tic-tac-toe. Students were already familiar with Think-Tac-Toe's having completed them before in previous science and social studies units. The green group was told they would have three days, including that day, to complete the Think-Tac-Toe. They would be working independently and should finish at least one activity each day. If they finished early, supplemental videos were on the website. The teacher explained each of the nine activities to the students, answered questions, and dismissed the green group to start working. Then it was time to change groups.

The Red group moved to the front of the room to meet with the teacher, the blue group went on the computers to watch Day One's video and continue their list of adaptations, and the green group began to work on their Think-Tac-Toe. In their meeting with the teacher, the red group discussed what an adaptation was, and what adaptations they remembered from the video. A graphic organizer was handed out, it contained fill in the blank definitions for camouflage and adaptations as well as a chart with space to list 5 animals, an adaptation each animal had, and how it helped (See Appendix G). The definitions were completed together, and students were told that in their next center they were to fill out the graphic organizer using what they remembered from the video, the group discussion, and their book if they needed it. If they did not finish the organizer in class, it was homework. Additionally, the Red group's homework was handed out. The homework was a worksheet about their favorite animal in which they were required to name their favorite animal, tell where it lived, and list three adaptations and how they helped the animal survive (See Appendix H).

Finally, it was time to switch groups again. The green group continued working, the red group went to their desks to work on their graphic organizers, and the blue group came to meet with the teacher. The blue groups discussed all of the adaptations they had seen in their books and their videos. They discussed which ones they thought were coolest, and how they helped animals survive. For homework, a fill in the blank worksheet relating to the book's discussion of moths was handed out. Students were told that they would go over the answers the next day when they met again.

The second day was very similar to the first. The lesson started as a whole group. The students were told that they would be learning about mimicry and other abilities that helped animals survive. Students were asked what mimicry was, and after answering, they were shown a video on the Mimic Octopus from the website. Next, the students continued to work in their groups, but because the green group already had their instructions, the teacher only needed to meet with two groups, making each center about twenty The blue group started out by watching the video listed under day two on the website, reading pages B68 and B72, and making a list of abilities that helped animals survive. The Red group met with the teacher, discussed their graphic organizers from the previous day, shared their favorite animals with one another, and then discussed what they knew about mimicry and other abilities that help animals survive. Once again, a graphic organizer was handed out. It contained a fill in the blank definition for mimicry, and a chart with space to list four animals, abilities they had that helped them survive, and how the abilities helped them (See Appendix I). They were watch day two's video and use it to complete the graphic organizer in the next center. The red group's homework was a page from their workbook that contained pictures and fill in the blank questions about abilities animals used to survive.

When it was time to switch groups, the red group went to watch the video and work on the organizer and the blue group came to meet with the teacher. The blue group discussed the lists they had made and talked about their favorite abilities. The group discussed what mimicry was and talked about the example of the monarch butterfly in the book. Next the group's homework was introduced. Students were told that humans use mimicry too. They might mimic appearance, or a way of talking/acting to achieve a goal such as fitting in or being cool. For homework students were to write a story, either real or imaginary about a time they or someone they knew used mimicry. They would get a chance to share their mimicry stories at the end of the week. Before the group broke up, students helped one another brainstorm for their essays.

The third and final day of instruction began with the whole class meeting again. Because it was more difficult than the previous concepts, the teacher explained the differences between inherited and learned behaviors to the class. The teacher told the class that they would be covering many examples of each today and that some of these examples would be on the test. Once again the green group continued to work on their Think-Tac-Toes. This was the final day to finish them. Together with the teacher, the red and blue groups read pages B70 and B71 with the teacher. The teacher made sure to emphasize the vocabulary words and the examples on these two pages. Next the blue group reread the pages making a list of inherited behaviors, and learned behaviors while the red group met with the teacher. The red group worked together with the teacher to complete a Learned vs. Inherited Behavior worksheet (see Appendix J). When it was time to switch groups the red group was given a workbook page on the same topic to complete. The blue group went over the lists they had made with the teacher, and any misconceptions were corrected, they then completed the workbook page with the teacher. There was no homework because this lesson took place on a Friday.

Day four was the review day before the test where students were able to share what they had learned. The green group was given a chance to present their Think-Tac-Toes to the class, the red group was allowed to share their research on their favorite animal, and the blue group was allowed to share their mimicry stories. Students asked one another questions about what they had learned, and the main points of the unit were reviewed through pointing out what students did well in their presentations. For homework students were told to study what they had done during the unit. The red group had their graphic organizers and worksheets, the blue group had their lists and workbook pages, and the green group had the think-tac-toes. The final day was the test.

Data Collection

Teacher-Researcher Journal

Throughout the entire study, a teacher-researcher journal was kept. In it I recorded my day to day observations, reactions to what was going on in the classroom, questions I came up with, and problems I came across. The journal served as an outlet for both what I saw in the classroom, and my evolving thoughts about the study. I wrote about what I realized as I was teaching lessons, what I could have done instead, and what I might do next time. The journal also served as a record of my listening to students. Throughout both phases of the study, my knowledge of the students continually grew and changed. The teacher-researcher journal not only served as a place to record what I learned and my thoughts about the students, but also as a reference to look back upon to see how my understanding of students changed over time. The journal was a reflective tool I used to both capture data and help me further my understanding not only of my students and the study but of myself as a researcher.

Student Survey

In the first week of conducting research student surveys were sent home. These surveys served as an initial introduction to get to know the students. The survey asked about students likes, dislikes, interests, hobbies, and family make-up. It also included a section for the students to tell me something important that they thought I should know about them. The goal of the survey was not just to learn about the students and school, but to learn about what they did outside of school, who they were outside school, and what they thought was important about themselves. This survey served as a sort of an introduction to listening to the students, and helped give me insight into topics the students' and I could discuss in their student-teacher journals.

Student Journals

After introducing the teacher-student dialogue journals, they became a rich source of data in learning about students. Students were allowed to write about anything in these journals so I was able to learn a lot about students' lives outside of school. Students wrote about a variety of topics, and the fact that I responded to students' writing led to some interesting and insightful conversations with students. These journals served as a window into what students wanted to talk about and thought was important to share with me. In the instances where students were assigned journals prompts, the journals provided a more comprehensive, if less in depth view of the students. Through such prompts I was able to gather data about what students knew and thought about a topic and the range of levels and ideas in the class.

During the study, these journals served as the single biggest data source for listening to students. The journals were initially tailored to focus on listening to individual students. They served this purpose well, allowing me to get to know students far better than I would have

without this mode of communication. But surprisingly, the journals also helped me listen through the other three lenses. By seeing similarities and differences in what the students wrote in the journal, I was able to grasp the rhythm and balance of the classroom. The students' discussion of the immediate families and outside of school activities provided a window to listening for the social, cultural, and community contexts of students' lives. Finally, by looking at which students didn't write, and what they didn't write about, I was able to listen for silence. The data collected from the journal will be examined in depth in the next chapter.

Student-Adult Interview

The student-adult interview was used a form of pre-assessment for the differentiated unit. By asking the students to interview an adult in their lives, this assignment provided information about who the student communicated with at home, and what they knew about what the student was learning in school. This interview provided a glimpse into the home culture of students and allowed a chance to listen to students out of school contexts. Additionally, seeing who the students chose to fill the survey out with was interesting. Finally, interview helped explicitly connect the students' home lives and school lives.

Differentiated Unit and Student Work

The three groups in the differentiated unit were all asked to complete different assignments. How the students responded to what was asked of them and their ability to complete assignments reflected whether or not students were being given work at the appropriate level. Similarly, regardless of the group, students were given some independence in what animals they learned about. The choices students made in such cases helped reflect their interests. Finally, while all groups gained a basic understanding of the concepts being taught in

the unit, the different assignments allowed students in some cases to show deeper or wider understanding of the topic.

Data Analysis

Because this study's data sources were being used as tools for listening, data was constantly being analyzed and utilized throughout the study. The student surveys, student-adult interview, and animal survival pretest were all examined immediately after their completion in order to inform instruction. Likewise, student journals were analyzed on a daily basis in order to listen to students and tailor instruction to their needs. After the completion of the study, all of the data sources were examined to see how listening informed and affected differentiated instruction. Data was classified into the four types of listening and was then analyzed to understand what impact each type of listening had on the classroom. This was done by seeing how the information from each type of listening impacted instruction. The goal was to isolate how each respective type of listening impacted instruction. This analysis is described in depth in the next chapter.

Chapter IV

Analysis of the Findings

Introduction

Chapter four examines the data gathered throughout this qualitative teacher research. As previously detailed in chapter three, a variety of data collection methods were used to ensure accuracy, Data were triangulated through: student surveys, teacher researcher journal, student-teacher journals, student-adult interview, unit pretest, and student work from the differentiated unit. An analysis of the aforementioned sources yielded themes to draw conclusions about the question this study sought the answer: *What happens when I use a listening framework to inform and examine a differentiated science unit.*

During the analysis of the data, four major themes became apparent. These themes were discovered by examining the links between listening, differentiation, and the classroom community. Initially based on Schultz's (2003) Listening Framework, the themes that emerged were that listening to know particular students was a way of informing differentiation and developing a working relationship with students, listening for the rhythm and balance helped create a productive learning environment and maintained classroom management, Listening for the social, cultural, and community contexts of students' lives led to better understanding of student interests and involvement; and listening for silence and acts of silencing was an effective way of making sure everyone's needs were met. This chapter is broken up into four main sections based on these themes, with one smaller section at the end that gives a comprehensive analysis of the differentiated unit.

Listening to Know Particular Students – Informing Differentiation and Developing a Working Relationship with Students

Of Schultz's four types of listening, the one that occurred most often in this study was listening to know particular students. This is most likely because students are what form the basis for any type of listening in the classroom. In order to listen to the rhythm and balance one must know what it is that makes up the rhythm and balance. In order make connections between the student and his or her social, cultural, and community contexts, one must know the student. In order to listen for silence, one must know who is and isn't talking. The basis for all types of listening is getting to know who is in the classroom, not just as students, but as people. During the study, two distinct benefits arose from listening to know particular students. First, the more I knew about particular students, the more informed I was in tailoring instruction to their needs. Second, the more I communicated with students, the more they seemed to like and respect me.

Informing Differentiation

As discussed in chapter two, the crux of differentiated instruction is being aware of students' readiness levels, interests, and learning profiles, and then using this knowledge to tailor the content, process, product, and/or environment of the lesson. Learning about students' readiness levels, interests, and learning profiles is also a part of listening to particular students, and as I found out in gathering data, students often reveal much about these things with or without prompting. The student survey, which was mainly targeted toward this component of listening only explicitly asked one question about learning profile, but in examining the surveys, additional information about student readiness levels, interests, and learning profiles could be found.

The only question in the survey that the explicitly addressed a component of differentiation was number sixteen, a question I had added. It asked students whether they like learning by reading, writing, listening, and/or doing (explained to the student as hands on activities). This question helped inform me about how individual students preferred receiving their content, and also gave me an overview of the class preferences. The most popular choice was listening with thirteen students choosing it, followed by doing with ten, writing with seven, and reading with only four.

This was not the only question that helped inform me about students' learning preferences though. Questions number four and five asked the student to list something he or she was good at and something the student needed some extra help with. Although these questions did not refer specifically to school (the students were told that they could talk about anything, whether it be video games, sports, or hobbies), many students chose to talk about a subject they thought they were very good at or needed help with. While most simply stated the subject, some students, such as Mark and Jen, were more specific. Mark stated that he was very good at multiplication, and Jen admitted she needed some extra help with division. Even the students who did not specifically talk about a strength or weakness dealing with school often provided valuable information about their learning preferences. I learned that John was very good at hockey and Doug was talented at baseball (indicating these were sports they were interested in.) I also learned that Laura was good with computers and Mallory rode horses. While not directly related to school, learning these things helped me to tailor instruction for the students. When helping John and Doug in math, I often tried to phrase word problems in sports terms; when the class needed a student to monitor the laptop cart, Laura seemed a perfect choice; and when Mallory chose a horse as the animal she would research during our differentiated unit, I was not the least bit surprised. Other questions sometimes also provided

insight into students' interests. I learned from question eight that Jonna loved rabbits. From question fifteen I learned that Courtney loved animals (on question two, she listed her six fish and two cats before her mom and dad). Igor's answer to question thirteen showed that he had an interest in the military and in nature. Finally, even answers that did not directly relate to an interest or readiness level also helped inform differentiation in some cases. Answers to questions one and two often indicated certain instructional models that students liked or disliked, such as experiments or group work.

Student surveys were not the only data source in which listening to particular students was used to inform differentiation. The student-teacher journals, which students wrote in for four weeks prior to the differentiated unit, and two weeks afterward were another very rich source of data. Because the students were given so much freedom with the journals, there was a very wide range of responses. Students wrote about very different topics at very different frequencies. Some students wrote almost every day, some wrote once a week and some wrote only when prompted to. Regardless of how frequently students wrote though, the journals were like a conversation between individual students and I. Because of this, topics discussed in the journals were covered in much more depth than in the surveys. The journals proved to be an extremely effective tool for listening.

Even though the journals were even less structured than the student surveys, a great deal of the information shared in the journals helped inform instruction. About one –quarter of the class explicitly asked about topics we were learning or going to learn about in school in their journals. Jason wanted to know if and when the class was going to learn multiplying fractions and algebra. He was always curious what we were going to learn next in math. Similarly, Jack asked when we were going learn fractions, and later wrote that he was already learning how to

multiply fractions because he went to Kumon after school to practice math. Even though I was already aware of the fact that Jason and Jack were both very talented in math, their journal entries provided extra information that would allow me to enrich their education with work they were interested in.

Students did not just write about topics they were good at and wanted to know more about though. On the second day after journals were introduced, Mark wrote "Can you help me in reading? I'm not very good." Mark was actually very good at reading, but a new reading series had been introduced in the school, and almost everyone was having trouble with it. Mark perceived his B's as unacceptable and asked for help. In responding I explained to Mark that the new stories were a challenge for everyone because they were different from what the students were used to and drew on different skills. I continued to tell Mark that his grades were not bad, but that if he wanted some tips, the key to doing well was looking back in the story. The new reading series asked many questions that required this of the students, but because students were not used to looking back, they often just tried to remember and guessed the answer instead. I asked Mark to make sure he looked back when answering questions and write to me later telling me if it helped. Unfortunately, Mark did not write back to me, but he did happen to get an A on that week's reading test.

Sometimes, I initiated conversations about certain subjects with students. One student in the class, named Cameron, often wrote to me about her family and what she did outside of school. In recent weeks, Cameron had been having trouble in math. Cameron had an IEP, and attended the resource room for reading. The math we had been doing around this time involved a lot of problem solving with word problems. I was fairly sure that Cameron's recent difficulty had to do with reading these word problems and figuring out what to do, but I wanted

to see what Cameron thought. So I asked Cameron in her journal, "What do you find trickiest about math?" She answered, "I think the hardest thing about math is the hard questions like if we took a test and at the end it says write to explain, those questions are hard for me…" She continued on to tell me that she did well in math the first two marking periods and that her mom told her not to give up and she thought this was good advice. I replied to her, "I agree the writing to explain problems are very hard. The trick to solving them is to find the key wards that let you know what operation to do." Her answer was short and to the point, confirming my suspicions, "I know how many and all that. I'm saying I don't know what that means." Cameron recognized she needed to find the key words such as "how many", but her problem was understanding what they meant. To help Cameron, I found a worksheet that contained a box for each operation and in the box listed all of the key words that meant you needed to use that operation. For example, some of the key words in the addition box were sum, total, together, and increased by. I stapled this worksheet in Cameron's journal and wrote "Does this help?" The next day she replied "Yes it does help me and I am going to study it." She later added. "That works a lot."

Journal conversations with students who were having trouble in certain subjects did not always work this well, but even when there was no simple solution, conversations still brought up valuable information. I learned that Doug did not like math because he did it very slowly. Alan thought reading was hard because he had trouble remembering what he read. Mallory said that math was hard, but after some questions, admitted that horse riding was also hard but she still liked it. For these students, I was not able to help solve their problems, but I was able to learn more specifically what they did not like and why. This was valuable information that I was able to use in day to day lessons. After hearing from Doug, I made sure not to pressure him

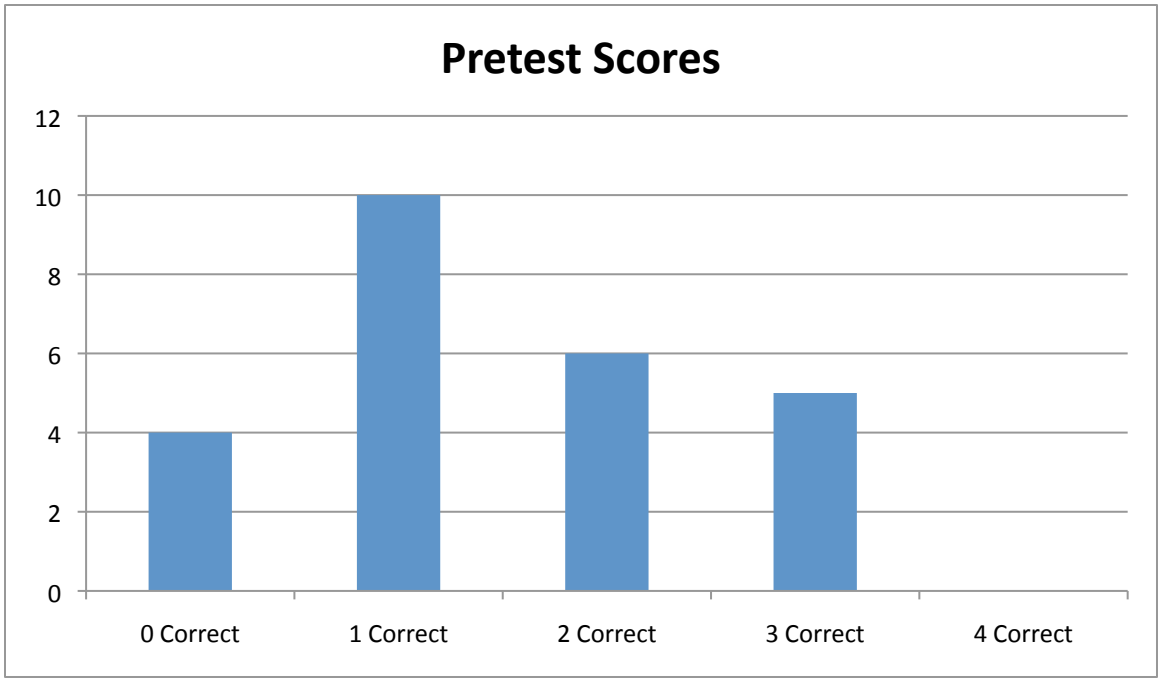
about time in Math, and after hearing from Alan, I encouraged him to go back and reread frequently.

Even when journal conversations did not explicitly talk about school subjects, they often still helped inform differentiation by revealing student interests. One day, after I did a small presentation educating the students about the tsunami in Japan, several students wrote further questions they had about the event in their journals. I wrote back to them directing them on how to find the information at home with an adult. Almost every student wrote about their interests in one way or another. Students talked about their favorite color, animal, bug, car, music artist, television show, movie, afterschool activity, trip, actor, pet, food, and many other things. While this did not directly relate to school, it still helped differentiate by interest from time to time. When Jason was having trouble thinking of a topic for his limerick, I remembered his passion for Lamborghini's and suggested that as his topic. I also was able to alter the process for some students in science and social studies lessons because Erin, Haley, and May had written about how they love drawing but never get to do it in school.

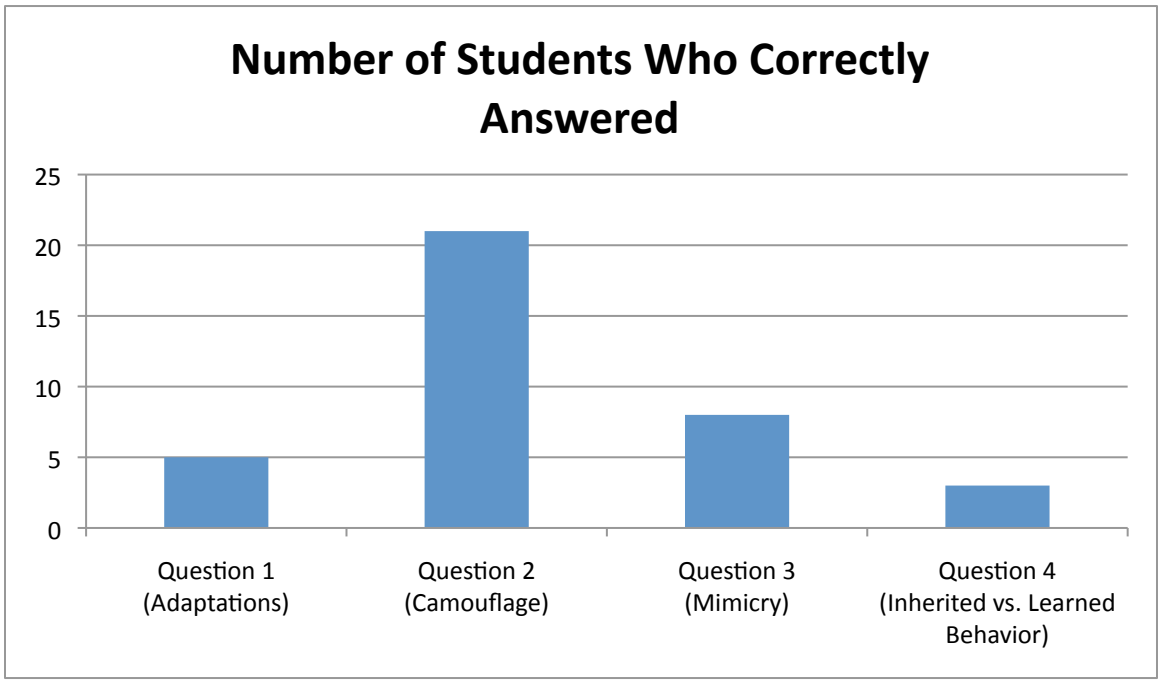
Finally, the student-teacher journals served as a great tool for informing differentiation when students were given prompts to write about. Prior to teaching the differentiated science unit, I asked students to write in their journals about their favorite lesson. I asked students to write what it was about, what they did in the lesson, and why they liked it. Almost every student wrote about a science lesson (even though I did not say anything about science or my unit in the prompt). The two most common responses, were a series of science experiments I had done on chemical changes earlier in the year (vinegar and baking soda; vinegar and a penny; lemon juice and a penny; and soap and milk), and a science experiment many of the students did in second grade where they threw marbles at the ceiling to emulate craters on the moon.

The similarities between the favorite lessons indicated that students really enjoyed hands on activities and figuring things out.

The final data source in which listening to particular students was used to inform differentiation was the unit pretest. This data source was specifically targeted to find readiness levels for the upcoming unit. Questions were left open ended and examples were requested in order to help assess exactly what each student knew. The pretest contained 4 questions (See appendix for a copy of the pretest). Graph A shows how the class scored on the pretest and Graph B breaks down the correct answers by question. Interestingly, the only students who got question number two wrong, were those who got every question wrong. Similarly, students who answered only one question correctly, all answered number two correctly, but answered the other three incorrectly. This clearly indicated that the majority of the students in the classroom were already familiar with camouflage and could name at least one animal that used it. The class was not as familiar with the other three concepts asked about in the pretest. Interestingly, many students incorrectly read adaptations as adoptions in questions one, and answered that it was when you go to a shelter a bring and animal home to keep. Overall, about the class was split pretty evenly between those who got zero or one correct, and those who got two or three correct. In deciding the grouping for the unit, students who scored zero or three were put in the high support and low support groups respectively, and those who scored a one or a two could be placed in any of the three groups based on data from teacher observations and their journals, surveys, and class work.



Graph A



Graph B

Developing a Working Relationship with Students

Aside from helping to inform differentiation, listening to particular students had a noticeable effect on the way students reacted to me, and I to them. Looking back, this seems to be a result of the way the journals were introduced and structured. The journals were introduced to the students in a very open-ended way. Students were told that I wanted to get to know them better. I explained that there wasn't enough free time in the school day to talk to everyone about non-school related topics, but that didn't mean I wasn't interested. It was a common occurrence in the class for a student to come up to me during a second of free time, such as when we were lining up or walking down the hall and start telling me a story about something they did, or ask me a question about something I did. Unfortunately, these were inappropriate times to be talking so I had to ask the students to quiet down and tell me later. When I introduced the journals, I told students to write down all of their stories and questions that there was not have time to listen to during the day, and I would read them and respond after school. After the advent of the journals, instead of asking students to wait for a later time that might never come to tell me a story, I could simply say "write it in your journal."

As previously stated, only one-quarter of the students asked about topics we were learning or going to learn in school, and even these students did not exclusively write about school. Indeed, the vast majority of journal entries did not directly relate to school at all. A significant amount data could be extrapolated to help inform differentiation, but it was not for that purpose that the students were writing in their journals. They were writing because they wanted me to get to know them better, and they wanted to get to know me better. I noted in the teacher-research journal that I was surprised at how anxious the students were to find out about me. I was asked about my favorite color, animal, TV show, movie, actor, book, car, music

artist, subject, and many other things. I had no problem sharing this information with my students so long as they too answered the questions they were asking.

A week after the journals were implemented in the classroom I began to notice a change in my relationship with the students and the way they reacted to me. Students who wrote to me often in the journal seemed to be on slightly better behavior. Jordan and Rick, two very talkative students who had begun to write to me a lot in the journals started becoming a little less talkative when I was teaching. When disciplining them, it seemed that my disappointment suddenly carried a bigger weight. Jordan and Rick had begun to not only value my opinion of them as a teacher, but also as a person who they talk to regularly. Cameron, a student who had always been very reserved around me, suddenly became more talkative after she began writing to me regularly. It was clear that the writing back and forth with her in the journals had increased comfort level with me. Finally, aside from students reacting differently to me, the journals also caused me to react differently to students. As I learned more and more about particular students, my knowledge affected my interactions with them. I was now able to relate what we were learning with something the students had discussed with me in their journals. For example, when I introduced a weekly writing prompt about a place we want to travel, I knew from her journal that Jonna wanted to go to Canada, so I had Jonna come up and together we completed an example outline for Canada. As a result of the journals, taking into account what students wrote to me about became second nature.

Listening for Rhythm and Balance – Creating a Productive Learning Environment and Maintaining Classroom Management

Because this study took place in a student teaching setting, by the time I came into the classroom, the rhythm and balance had already been established. Students already had a set

schedule and knew what to do. Classroom routines had been practiced many times and were now second nature. Upon entering the classroom I observed the rhythm and balance carefully, and when it came time for me to take over the classroom, tried to maintain what the classroom teacher had created. Because we were different people though, the rhythm and balance did shift. And as I introduced new classroom routines such as the student-teacher journals, surveys, and other instructional techniques that were new to students, the rhythm and balance changed. At first, I was able to listen to the rhythm and balance only through observation. When student-teacher journals were introduced, they became another valuable source of data. Looking back on the data it became clear that listening for the rhythm and balance served as an effective way of creating a productive learning environment and maintaining classroom management.

Creating a Productive Learning Environment

One of the goals in any classroom is to create a productive learning environment. My cooperating teacher had done a wonderful job of establishing rules and routines that did this. By listening to the rhythm and balance of the classroom I studied what made the classroom work. One aspect of the class that I noticed besides the rules and routines of the class was the seating arrangement. Both in my initial observations and in student journal entries I found a lot of information about how to effectively arrange the class. By observing the teacher, I noticed she followed three rules. First, she kept students who talked to each other too much far apart. Second, she kept students who required the most attention close to her. Finally, she placed students who were almost always on task and willing to help out next to those who often fell behind and became lost. The third rule is what really stood out to me. By having students help one another it really helped keep the class on track.

When students began writing in their journals, I learned even more about how to arrange the class effectively. Aside from the students who asked to be seated next to their friends so they could talk, some students had valid requests for seating. Jordan wrote in his journal that he was having trouble seeing in his current seat and wanted to be moved closer to the front. He said he did better when he sat in the front. Mallory asked to be seated away from Erin because she was a distraction and they did not get along. Similarly, Erin asked to be seated away from Rick because she did not get along with him. Although these were individual requests, arranging students properly had a huge affect on the rhythm and balance of the classroom. Seating arrangements were changed in the class once a month. One time, shortly before journals were implemented, the teacher and I came up with a new seating arrangement. The next three days, the classroom was in chaos. It was obvious that the rhythm and balance had been thrown off, and we were forced to switch around quite a few students before things calmed down again.

Maintaining Classroom Management

As previously stated, a classroom management system was already in place when I began teaching and conducting my research. Because my teaching style was slightly different from my cooperating teacher's and because I implemented new routines in the classroom in order to conduct research though, classroom management changed as I took over. Listening to the rhythm and balance of the classroom helped the students and me to deal with these changes. After I took over, I noticed a lot more students calling out. When I looked back, I realized that it was most likely because I asked a lot of open ended questions and was not clear about when I wanted students to call out or raise their hand. The next day at the beginning of our reading lesson, I explained to students what I had realized and told them that I would raise

my hand while asking a question if I wanted them to raise their hands to answer. The discussion only lasted a few minutes, but the lesson went on with a lot less calling out.

Introducing new routines, such as the student-teacher journals, also changed the rhythm and balance of the classroom. After introducing the journals I noticed some small, but important changes in the classroom. I noted in my teacher research journal that sometimes, when students finished early, they would write in their journals instead of talking to a friend. Likewise, fewer students approached me during free moments because they knew I would just ask them to write whatever they were going to tell me in their journal. My way of returning journals was to leave them on the students' desks after responding, and when students came into the class in the morning, they would check their journals before even unpacking. The class as a whole also seemed to become slightly more attentive and respectful after the journals had been around for a while. It seemed that listening to individual students also helped maintain the rhythm and balance in my classroom.

The classroom management that was created through listening for rhythm and balance was essential in teaching the differentiated unit that was part of this teacher research. The unit required three groups to work on three different things at the same time, with the teacher only supervising one group. The only reason this was possible was because centers and independent work were part of the rhythm of the classroom. Students were used to being in centers two to three times a week, and while the differentiated unit worked a little differently, students were familiar enough with moving around and following instructions independently that the lessons were able to work.

Listening for the Social, Cultural, and Community Contexts of Students' Lives -Understanding Student Interests and Involvement

As a teacher, I saw my students for six and a half hours every day, five days a week. We spent a lot of time together. Listening to students though, it became clear that school was only one aspect of their lives, and was often not the most important one. Six and a half hours a day, five days a week is indeed a lot of time, but it is only a fraction of the twenty-four hours in each of the seven days per week. The fact of the matter was that students spent much more time out of school than they did in it. School was just one of the many contexts students lived in and learned from, and often times it was not the most important one. Realizing this, it became very important to listen for the other contexts in students' lives and to try to understand and link them to school. This was easier said than done though; it was only through student surveys, student-teacher journals, and the student-parent interview that I was able to get a small glimpse of students, social, cultural, and community contexts. As I learned more about students' lives outside of school, it became clear that there was a large link between outside of school contexts and interests and involvement.

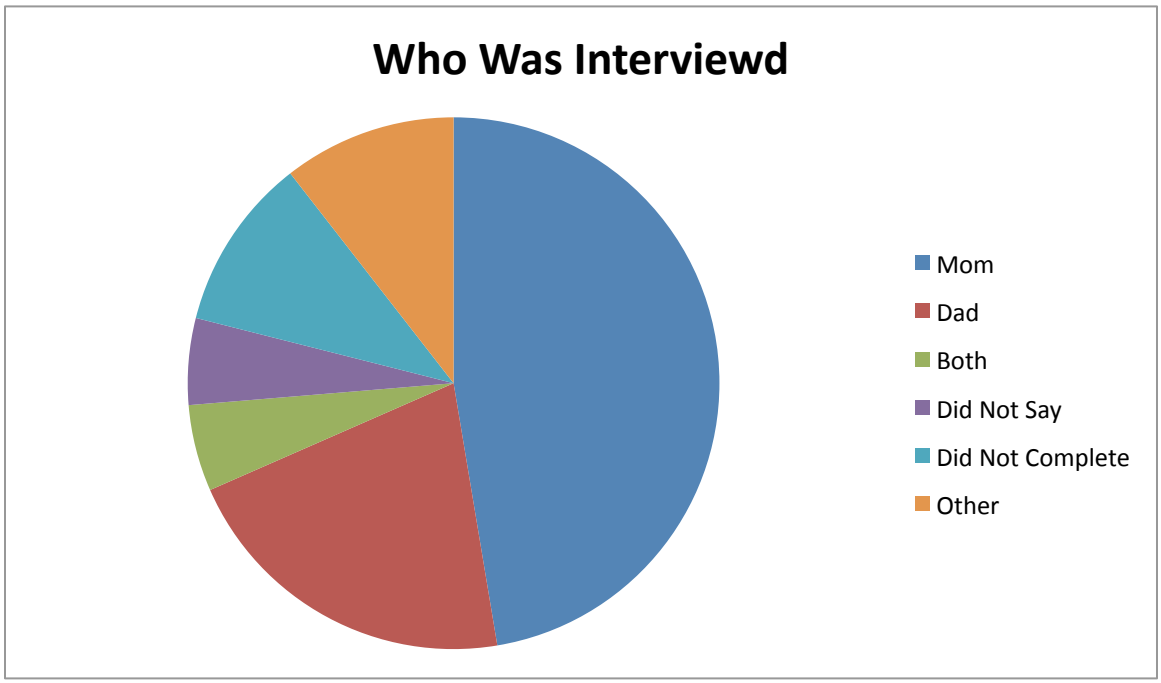
In the student surveys, questions eleven and twelve asked about what activities students liked to do with their friends and by themselves. The answers to these questions provided some insight into students' out of school activities. Some common answers to question eleven were playing outside games, such as tag, sports, and video games; answers to question twelve included video games, listening to music, reading, and art. Some of these outside activities were much more important to students that school was, and recognizing this could be a powerful tool in instruction. John loved hockey, he wrote about it in his survey, and actually often left school early to attend hockey practice. He also had a problem with rushing through

assignments. One week, our writing assignment was to write an expository essay on a person, place, or thing. I suggested to John that he write about hockey. He asked if he could write about his favorite player. I told him that would be fine. Students were given time to write their rough draft in class that day, and were asked to finish it for homework if they had not done so in class. The next day, as we were peer editing our rough drafts, John raised his hand. As I came over, he was very excited to show me that he had written three whole pages about his favorite hockey player! He had done a great job, including lots of important information and interesting facts, not to mention that this essay was three times as long as what he usually wrote. When linked with an outside context that John valued, his interest and involvement in the assignment increased greatly.

Student journals also served as an important tool for learning about students outside of school contexts. Many students wrote about their families, and trips they had taken. I was able to allow students to share their experiences with the class in an essay about their favorite place they had been or wanted to go. Students were very excited to share their experiences or research their favorite place and share it with the class. Rick and Jordan wrote in their journals about how much they loved music, and how they listened to a lot of hip-hop and rap. To incorporate their interests into learning, I made sure to include a box on the think-tac-toe's (choice boards) in science and social studies that allowed students to create a song about the topic we were learning as a form of assessment. In social studies, both Rick and Jordan created their own songs about the three branches of government. They took popular songs of the time and changed to lyrics to represent what they had learned. The whole class was very impressed.

Finally, the student-parent interviews about animal survival were intended not only to give the students a brief introduction to the topic, but also to see who worked with the students

at home. The survey, sent home in the students' test folder, an items parents had to go through and sign every week asked parents to spend ten to fifteen minutes answering some questions about animal survival with their child. I told the students that either they could write the answers or their parents could. Graph C shows who completed the surveys with the students.



Graph C

The majority of students received help from their mothers, while about half that amount received help from their fathers. One student interviewed both of her parents, while another did not record who he interviewed. Despite the interview being in the test folder, two students did not complete the interview. One student had a signed interview that his father refused to answer, and one student had an interview the he had tried to complete himself

without an adult. One student had the interview completed by her foster father, and one student had it completed by a nurse at the pediatric facility where he lived. The goal of this assignment was to link what students were going to be learning in school, with their home context, and many students reported back that they had enjoyed questioning their parents about what they remembered.

Listening for Silence and Acts of Silencing – Making Sure Everyone's Needs Are Met

Of the four listening contexts, listening for silence was by far the hardest to gather data on. Listening for silencing requires looking across all three of the previous listening contexts to see who is being excluded and what is not being talked about. It was only towards the end of my research I realized that in listening to some students, I had been silencing others. As I reviewed my data I realized that although I had student surveys, parent interviews, and pretests, from all the students, two students' journal entries almost non-existent. Examining which students were lacking journal entries, I realized that I had been silencing these students.

Both of the students were students who went to the resource room for math and reading. They were not being silenced because they were in the resource, I had recognized that the majority of their time was not spent in the main room class and asked the resource teacher if they could keep their journals in the resource room. Other students who were also in the resource room had written much more in their journals. Of the two students who did not write in their journals, Mike hated writing more than any other activity in school, and Sally was on a pre-primer reading level. Because I had selected the mode of communication as writing, I had excluded and silenced these two students. By the time I realized what I had done, I only had two weeks left in the classroom. I sought to talk to these two students when I had free time, but this

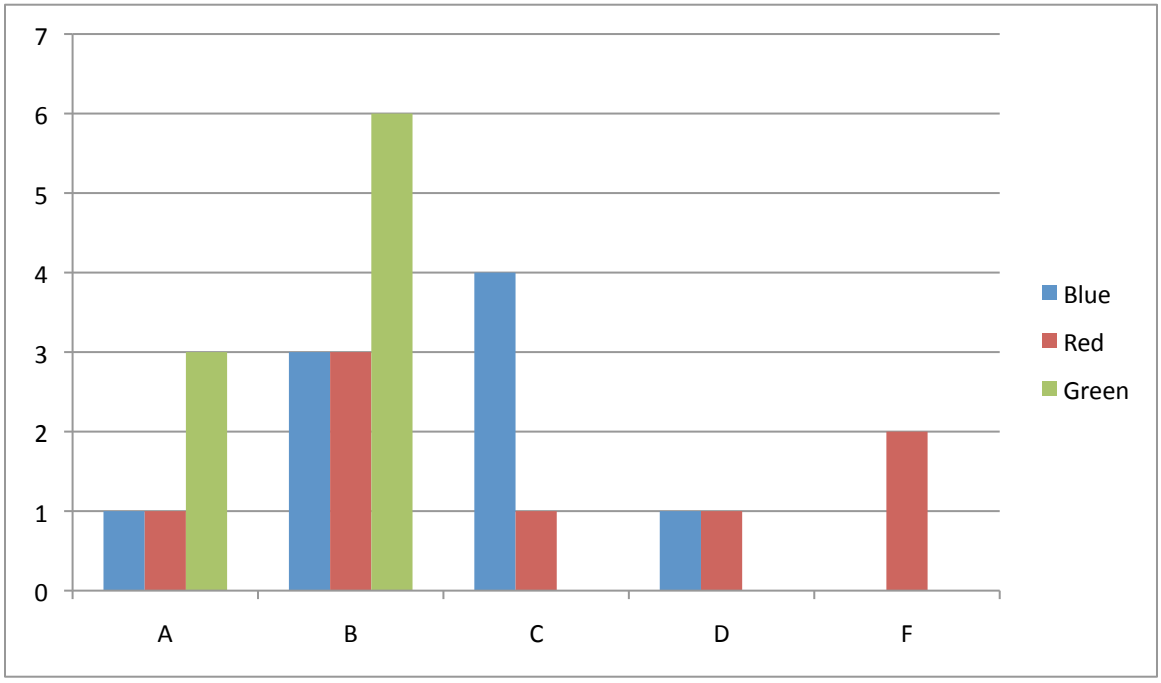
did not happen very often. In the end I still got to know Mike and Sally very well through classroom interactions and discussion, but it was very interesting to me that in trying to listen, I had actually silenced two students.

Teaching a Differentiated Unit based on Listening

The differentiated unit taught at the end of this teacher research was the culmination of listening to students for the previous month. Although the topic limited how much student interests could be taken into consideration, my knowledge of individual students' strengths, weaknesses, learning profile, as well as the working relationship with students and rhythm and balance the classroom had gained through listening all played a huge role in the teaching of the unit. By the time the unit began, I was acutely aware of what individual students could and could not do. I was able to keep my expectations high for each group without asking the impossible. At one point, a student in the red group, Nate, complained that the work was too hard and he couldn't do it. Had I not been listening to Nate for the past month I might have agreed with him. But having known Nate to underestimate his ability in his journal, I once again gave him the instruction and gave him a little help on the first blank space of his graphic organizer. "That's it? He asked. "Yes" I replied, "See, You CAN do it!" He looked up at me slowly, and with a grin on his face "You're right!" This occurred on the first day of the unit, and Nate did not have another problem for the rest of the week.

Although the unit was short, I asked students to write in their journals about it during and after the unit. Student responses were mostly positive, with responses including that they liked what they were doing, they liked being in different groups, they loved learning about animals, they liked the videos, and they liked the website. Only two students complained that they wanted to be in a different group, and this was because their friend was in the other group.

On review day, students were extremely excited and happy to share what they had learned. Even though it took close to thirty minutes to present all of the Think-Tac-Toes, students remained quiet and focused, giving their peers the attention they deserved. Likewise, the green group did the same while the red and blue groups presented their respective activities. It was very clear during this review and sharing day that students knew they had worked hard and wanted to share what they had learned. I noted in my journal how great a job the students did of listening to one another. Despite giving the lower readiness groups much more support though, test scores still remained skewed in favor of the green group (Copies of the test and modified test for students with an IEP can be found in Appendices K and L). The groups' test averages were as follows, green – 90.6%, Blue, 80.6%, and Red, 76.9. The class average was 83.3%. Graphs D show the breakdown of scores by group.



Graph D

Conclusion

In this teacher research I sought to examine the relationship between listening and differentiated instruction. This was done by gathering data about students using Schultz's (2003) Listening Framework, and using it to inform differentiation. By separating the data gathered intro Schultz's (2003) four components of listening, I was able to examine how each type of listening related to differentiated instruction and teaching strategies. I found that listening to know particular students was a way of informing differentiation and developing a working relationship with students, listening for the rhythm and balance helped create a productive learning environment and maintained classroom management, listening for the social, cultural, and community contexts of students' lives led to better understanding of student interests and involvement; and listening for silence and acts of silencing was an effective way of making sure everyone's needs were met. These conclusions will be further discussed in the final chapter.

Chapter V

Implications of the Study and Conclusion

Introduction

Chapter Four analyzed the data collected during this teacher research. It was found listening and differentiations have great synergy as instructional practices. This chapter will discuss the implications of this study and will include suggestions for future research based on what was found in this study.

Summary of the Findings

This study sought to find out what happened when Schultz's (2003) Listening Framework was used to inform and examine a differentiated science unit. After listening to students through various outlets for one month, teaching a differentiated unit based on the information learned about students, and looking back on the data gathered before, during, and after the teaching of the unit, it became clear that listening and differentiated instruction were extremely compatible. In fact, not only were they compatible, but listening was a natural extension of differentiation, and differentiation was the incorporation of listening into what was being taught. Differentiation and listening are two sides of the same coin. One needs to listen in order to inform differentiation, but at the same time, listening is useless without putting it into action through differentiation.

In my analysis of differentiation and listening I found that listening to particular students served as both a way to inform differentiation and build a working relationship with students. As I learned more about students through listening to them, much of what I learned help differentiate instruction in one way or another. Even when I listened to know my students

through surveys and journals, data sources not explicitly intended to inform differentiation, I still learned a lot of information that was valuable in differentiating instruction. Listening to know students often provided important knowledge about students that came of use at surprising spur of the moment times. Additionally, as I listened to know students, their reactions toward me and my reactions toward them shifted. My genuine interest in listening to the students seemed to garner respect from them, and at the same time personalized my interactions with students.

I also found that listening for the rhythm and balance of the classroom aided in the creation of a productive learning environment and helped maintain classroom management. By staying acutely aware of how students reacted to classroom rituals and seating arrangements I was able to figure out what worked and what did not. Even student input from their journals helped in the creation of a learning environment where students could work productively. Similarly, by examining how the rhythm and balance was thrown off when I began teaching, I was able to come up with solutions that helped maintain the classroom management my cooperating teacher had worked so hard to establish. It was also the rhythm and balance I had established with the students that allowed for the grouping and independent work that took place in the differentiated unit.

When I listened for the social, cultural, and community contexts of my students' lives, I found that I began to better understand students' interests and involvement in school. It was an unsettling but extremely important realization that for many students, school was not the most important thing in their life. By listening to students' other contexts though, I was able to find what was important to students, and link those things to school. Incorporating what students thought important into their school activities greatly improved their interest and involvement in

what their work. I also sought to connect students' school and home contexts by incorporating an adult-interview into the curriculum.

Although I was not initially expecting to find any students being silenced in my study, through the examination of my data I found that I had actually inadvertently silenced two of my own students. One of my most valuable data sources was in a format that one student was unresponsive to and one student was unable to complete. As a result those two students did not have the same chance the rest of their classmates did to communicate with me. Although they still interacted with me and a daily basis, they had no outlet for privately talking to me as the other students did. This realization showed that an important part of listening for silencing is making sure everyone's needs are met in any given activity.

Finally, I found that teaching a differentiated unit based on listening was a huge success. Students were separated into readiness level groups using a pre-test and the knowledge I had gained of them over the previous month. They were then given very different processes for learning the same content in different levels of depth. Students products were also varied, but all were excited and respectful in sharing and listening to what their classmates had learned. Students overwhelmingly responded that they had enjoyed the unit in their journals.

Limitations of the Study

This study faced a series of limitations. First of all, this study did not begin at the start of the school year. I was not able to begin listening to students from the first day of school, and by the time I entered the classroom, the rhythm and balance had already been well established. Second, I was in a student teaching placement during this study. This meant that although I was teaching students, I was not fully in control of the classroom. Additionally, there were some severe time constraints on the study. I was only in the regular classroom for half of a semester

before switching to my special education placement. I would have liked to have listened to students for even longer and taught more than one unit. Finally, both listening and differentiation are instructional techniques that are best executed once curriculum and routines are already familiar to the teacher. As a student teacher I was new to both of these things.

Implications of the Study for Teaching and Learning

This study sought to examine the relationship between the well known instructional strategy of differentiation and the less known listening stance. Many previous studies have examined differentiated instruction and proven its effectiveness. As discussed in chapter two, the benefits of differentiated instruction are well documented. One problem many teachers come across in trying to differentiate instruction is how to gather data in order to group students by readiness level, interest, or learning profile. Taking a listening stance in one's classroom solves this problem. Schultz's (2003) Listening Framework makes learning about students part of the daily routine. What is learned from listening can be used to both inform differentiation and assess whether instruction is effective or not. Differentiated instruction and a listening stance are both effective educational techniques alone, but together they can combine to help foster some truly powerful learning.

Conclusions

In today's educational world, with concerns over testing and student scores at an all time high, the focus in schools is often is often teaching to the test. Despite the increasingly heterogeneous population in public schools, one-size-fits all instruction still remains a norm. The fact of the matter is that there is no such thing as the "normal" student that this instruction is targeted to. Every student is different. When teachers choose one-size-fits all instruction, students are forced to adapt. But why should students be the ones to adapt? Why can't teachers

adapt instruction that fits their students? They can. By taking a listening stance in the classroom, and using what is learned to inform differentiation, teachers can learn a great deal about their students and create instruction that meets the needs of the varying learners in their classroom. By listening, teachers will not only be able to learn about their students but also understand the ins and out of how their classroom works and why, what is important in students lives besides school, and who's needs are not being met in the classroom.

Although Schultz's (2003) Listening Framework is recent in theory, what it is asking teachers to do is not. Being observant and learning about one's student is something teachers have done for many years and is something that all good teachers should do. The same goes for differentiation. Although seemingly complicated, differentiation is just using what one knows about students to personalize instruction, something good teachers have also been doing for years. Many are daunted by the numerous ways in which lessons can be differentiated, but as I learned in this study, not every lesson has to be differentiated in every way; such a thing is impossible. When trying to differentiate instruction it is best to start small and build on it. One can start by differentiating some lessons in one way, and as their comfort level grows with it, try new things and add other levels of differentiation. This study sought to examine what happened when a listening stance was added to differentiated instruction. The result was a system for gaining a holistic view of students and using the learned knowledge to plan instruction. Listening and differentiation used in conjunction are truly powerful.

Finally, on a personal note, this study taught me something extremely important about teaching, and school. This is something that seems common sense, but I feel might often be forgotten. Students are not the only ones who are expected to learn in school. Just as we expect students to learn the curriculum we provide them with, we, as teachers, are expected to learn

about our students in order to better educate them. While students are learning about math, reading, science, and social studies, we should be learning about students' interests, hobbies, home situations, and problems. I believe the reason differentiation and listening are such powerful instructional strategy is because they help structure our learning about students. Just as graphic organizers are tools given to students to aid in their learning, so are instructional techniques and strategies given to us in order to aid our learning. When we learn about our students, we are able to better educate them. In the end school is a place of learning for everyone, not just students.

Suggestions for Future Research

As of now, there have been no other studies and the relationship of listening and differentiated instruction. Further examination of this topic is still needed. Similarly, in this study the examination of home and community cultures was somewhat limited. A closer examination of listening to social, cultural, and community contexts in relation to differentiated instruction would be interesting. Finally, studies about listening in different age groups are needed. Students' values, needs, and ability to communicate change rapidly with age, and an examination of how listening affects students of different ages could provide information about when it is most effective to start listening, and at what age listening seems to work best.

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Appendix A

Student Survey

Name: Date:

Directions: Please complete the following sentences with information about yourself. Remember, no answer is a wrong answer on this sheet! Only your teacher will read your answers.

1. What I like most about school is _____

2. What I like least about school is _____

3. I wish the teacher would let me choose

_____

_____

4. I am really good at

_____

_____

5. I need some extra help with

_____

_____

6. In the classroom, I wish I could sit

_____

_____

7. In the classroom I behave

_____

because

_____

_____

8. My favorite book is

_____

because

_____

_____

9. I live with

_____

10. Three words to describe myself are

_____

11. I like to participate in the following activities with my friends:

_____

_____

12. I like to participate in the following activities by myself:

_____

_____

13. When I watch TV , I usually like to watch

_____

_____

14. If I were surprised with a gift of $1,000 cash, I would use it

to _____

_____

15. The one thing I really want my teacher to know about me is

_____

_____

16. I learn best by: (Circle whichever apply)

Reading Listening Writing Doing

- Found on Scholastic.com

Appendix B

Name_____

Parent/Guardian Interview

Dear Parent/Guardian,

Next week, we will be beginning our unit on Animal Survival. Because we have not yet started the unit, your child may or may not yet be aware of the different skills animals use to survive. Please give your child ten or fifteen minutes to ask you the questions included in this interview. It is alright if you are unsure of an answer to a question. This activity is simply meant to help your child build background for the upcoming unit and to share with you some of the things they will be learning about.

Directions: Ask your parent/guardian the following questions. Summarize the answers on separate sheet of paper. When finished attach the answer sheet to this paper.

1. Do you remember learning about animals in elementary school? If so, what do you remember? If not, what do you think some important things to learn about would be?

2. Name as many animals as you can that use camouflage.

3. In this chapter I will be learning about an animal trait called mimicry in which one animal mimics another in a certain way (usually in appearance) in order to protect itself from predators. Humans sometimes use mimicry to fit in or obtain a goal (dressing like someone they see on TV in order to be cool, or talking a certain way in order to fit in). Can you think of a time you used mimicry in order to achieve a goal?

4. What do you think is more important for humans, inherited behavior (reflexes we have from birth) or learned behavior (behaviors we learn through experience)? Do you think this holds true for all animals?

5. Think of your favorite animal. What adaptations or abilities does it have that allow it to hunt prey and/or escape from predators?

Appendix C

Name_____

Date_____

Animal Survival Pretest

1. What are adaptations? Give an example of an adaptation that an animal uses to survive.

_____

_____

_____

2. What is camouflage? Give an example of an animal that uses camouflage.

_____

_____

_____

3. What is mimicry? Give an example of an animal that uses mimicry

_____

_____

_____

4. What is the difference between inherited and learned behaviors? Give an example of each.

_____

_____

_____

Appendix D

<table>
<tr><td>Group</td><td>Day 1 (Camouflage and Adaptations)</td><td>Day 2 (Mimicry and abilities that help animals survive)</td><td>Day 3 (Inherited and Learned behavior)</td><td>Day 4 (Review</td><td>Test</td></tr>
<tr><td>Green</td><td colspan="4">Work on Think-Tac-Toe and Present them on Day 4 Watch videos and read book as needed.</td><td rowspan="3"></td></tr>
<tr><td>Blue</td><td>Read B66-B67 and make a list of adaptations/ Video / Meet with Teacher
Hw: Pg 107</td><td>Video and Read B68 and B72 make a list of animal abilities/Meet with Teacher
HW: Write a short story about a time when mimicry could come in handy.</td><td rowspan="2">As a whole group read pgs B70-B71, emphasizing vocabulary words and examples.
Blue Group – reread pages and make list of inherited and learned behaviors/ Sit with teacher and go through lists correcting any misconceptions/ IF time complete 7-15 on pg 109

Red Group – Complete Learned vs. Inherited Behavior WS with teacher/ Pg 109 7-15

If time go over Pg 109</td><td>Watch Think-Tac-Toe presentations and complete study guide.

If time, let students select videos to watch as a class.

HW: Study materials and study for Test.</td></tr>
<tr><td>Red</td><td>Video / Meet With Teacher / Graphic Organizer
Hw: Favorite Animal WS</td><td>Meet with teacher/Video and Graphic Organizer
HW: Page 108</td></tr>
</table>

Appendix E

Animal Survival

(This is an exact replica of what the website looked like)

Day 1 Camouflage and Other Adaptations

Watch the following video and list as many animal adaptations as you can!

Click the link then click the play button next to Chapter 5

Eyewitness: Survival--Adaptations

Day 2 Mimicry and Abilities that Help Animals Survive

The Mimic Octopus

King Snake Mimicry

Click the link then click the play button next to Chapter 4

Eyewitness: Survival--Animal Self-Defense

If you finish early…

Kratts' Creatures
(Watch Chapters 2-6)

Find me if you can! Camouflaged Animals

See how adaptations and abilities help animals survive in the ocean!

See what adaptations allow camels to survive in the desert!
(Click the play button next to chapter 3)

See what adaptations allow animals to survive in the rainforest!
(Click the play button next to chapters 4, 5, or 6)

Appendix F

Animal Survival Think-Tac-Toe

Look through your textbook and find 5 examples of how quick responses help animals survive.	**By yourself or with a friend, create a skit in which you act out three vocabulary words from the lesson.**	**Pick any concept from the chapter. Research the concept in depth on the internet. Record at least 5 important details that you find.**
In your own words, describe the difference between inherited behavior, instinct, and learned behavior. Tell which you think is more important for humans and why	**Create your own imaginary animal. Describe the animal; tell where it lives and what it eats. List at least five adaptations and quick responses that help it survive**	**Find the 6 highlighted vocabulary words in your lesson. Define them and give your own example of each.**
Draw a detailed picture showing an animal camouflaged in its natural habitat.	**Humans often mimic one another in order to be cool, or fit in. Write a story about a time you or someone you know used mimicry**	**Using terms from the chapter write a song describing how an animal of your choice survives in the wild**

Appendix G

Name_____

Camouflage and Adaptations

Blending due to color is called_____

_____ are traits that help organism survive. There traits develop from generation to generation.

Animal	Adaptation	How it helps the animal

Appendix H

Name_____

My Favorite Animal

My favorite animal is the _____

It can be found

_____

Three adaptations that help it survive are:

_____

_____

_____

These adaptations help it survive because:

_____

_____

_____

Appendix I

Name_____

Mimicry / Abilities that Help Animals Survive

When one animal imitates another it is called _____

Animal	Ability	How it helps

Appendix J

Name_____

Inherited vs. Learned Behaviors

1. Behavior that is inborn is _____ behavior
2. Behavior that is not inborn is _____behavior

Directions: Circle whether a behavior is Inherited or Learned

3. A reflex	Inherited	Learned
4. A frog not jumping at shadows	Inherited	Learned
5. An instinct	Inherited	Learned
6. Copying a parent is	Inherited	Learned
7. Blinking and salivating	Inherited	Learned
8. A dog learning a new trick	Inherited	Learned
9. Migrating south for the winter	Inherited	Learned
10. A dolphin jumping every time a trainer shouts "UP"	Inherited	Learned
11. Sweating and shivering	Inherited	Learned
12. Knowing to quietly line up and go outside when the fire alarm rings	Inherited	Learned
13. Spiders spinning a web and birds building a nest	Inherited	Learned

Animal Survival

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. A trait that helps an organism survive is a(n)
   a. adjustment.
   b. instinct.
   c. reflex.
   d. adaptation.

____ 2. A complicated inherited behavior is called a(n)
   a. reflex.
   b. instinct.
   c. adaptation.
   d. imprint.

____ 3. When one organism imitates the traits of another it is called
   a. copying.
   b. inheritance.
   c. resemblance.
   d. mimicry.

____ 4. Blending with surroundings because of color is called
   a. protective resemblance.
   b. concealment.
   c. camouflage.
   d. mimicry.

____ 5. Behaviors that are inborn are
   a. inherited.
   b. learned.
   c. copied.
   d. adapted.

____ 6. Migrating to find new food is an example of a behavior that is
   a. learned.

b. trial and error.
c. responsive.
d. inherited.

____ 7. Behavior that is not inborn, such as standing up when the fire alarm rings, is
a. inherited.
b. reflexive.
c. learned.
d. developed.

____ 8. An instinct, or complicated but automatic pattern of behavior, is
a. protective.
b. inherited.
c. reflexive.
d. adapted.

____ 9. A reflex, like scratching an itch, is an example of behavior that is
a. adapted.
b. copied.
c. learned.
d. inherited.

____ 10. When a mouse is able to find cheese in a maze, it is exhibiting behavior that is
a. adapted.
b. mimicry.
c. responsive.
d. learned.

____ 11. A dolphin jumping every time a trainer shouts “UP” is an example of:
a. learned behavior
b. instinct
c. inherited behavior
d. camouflage

Short Answer

12. List three adaptations or abilities that can help animals hunt prey or survive in the wild.

_____

_____

_____

13. How is mimicry different from camouflage?

_____

_____

_____

14. What do you think is more important for humans, inherited behaviors or learned behaviors? Why?

_____

_____

_____

_____

Animal Survival

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. A trait that helps an organism survive is a(n)
   a. instinct.
   b. adaptation.

____ 2. A complicated inherited behavior is called a(n)
   a. reflex.
   b. instinct.

____ 3. When one organism imitates the traits of another it is called
   a. resemblance.
   b. mimicry.

____ 4. Blending with surroundings because of color is called
   a. mimicry.
   b. camouflage.

____ 5. Behaviors that are inborn are
   a. inherited.
   b. learned.

____ 6. Migrating to find new food is an example of a behavior that is
   a. trial and error.
   b. inherited.

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   a. protective.
   b. inherited.

____ 9. A reflex, like scratching an itch, is an example of behavior that is
   a. copied.

b. inherited.

___ 10. When a mouse is able to find cheese in a maze, it is exhibiting behavior that is

a. responsive.

b. learned.

___ 11. A dolphin jumping every time a trainer shouts “UP” is an example of:

a. learned behavior

b. instinct

Short Answer

12. List three adaptations or abilities that can help animals hunt prey or survive in the wild.

_____

_____

_____

13. How is mimicry different from camouflage?

_____

_____

_____

14. What do you think is more important for humans, inherited behaviors or learned behaviors? Why?

_____

_____

_____

_____